

TEST DATA OF WDA90F-48

Regulated DC Power Supply
August 17, 2022

Approved by : Takashi Kajii
Design Manager

Prepared by : Jeonghoon Yi
Design Engineer

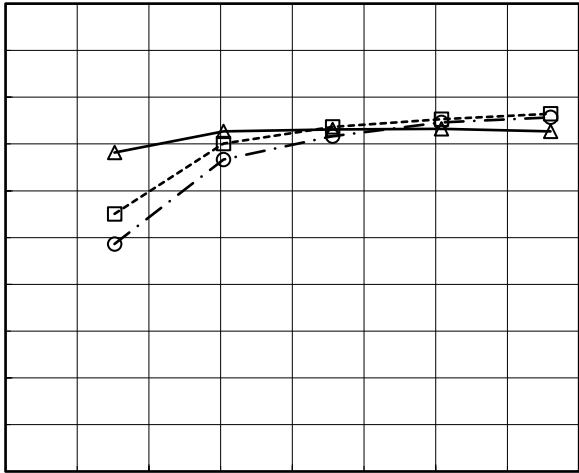
COSEL CO.,LTD.

CONTENTS

1.Input Current (by Load Current)	1
2.Efficiency (by Load Current)	2
3.Power Factor (by Load Current)	3
4.Inrush Current	4
5.Leakage Current	5
6.Line Regulation	6
7.Load Regulation	7
8.Ripple-Noise	7
9.Dynamic Load Response	8
10.Rise and Fall Time	9
11.Hold-Up Time	10
12.Instantaneous Interruption Compensation	11
13.Overcurrent Protection	12
14.Ambient Temperature Drift	13
15.Minimum Input Voltage for Regulated Output Voltage	13
16.Overvoltage Protection	13
17.Figure of Testing Circuitry	14

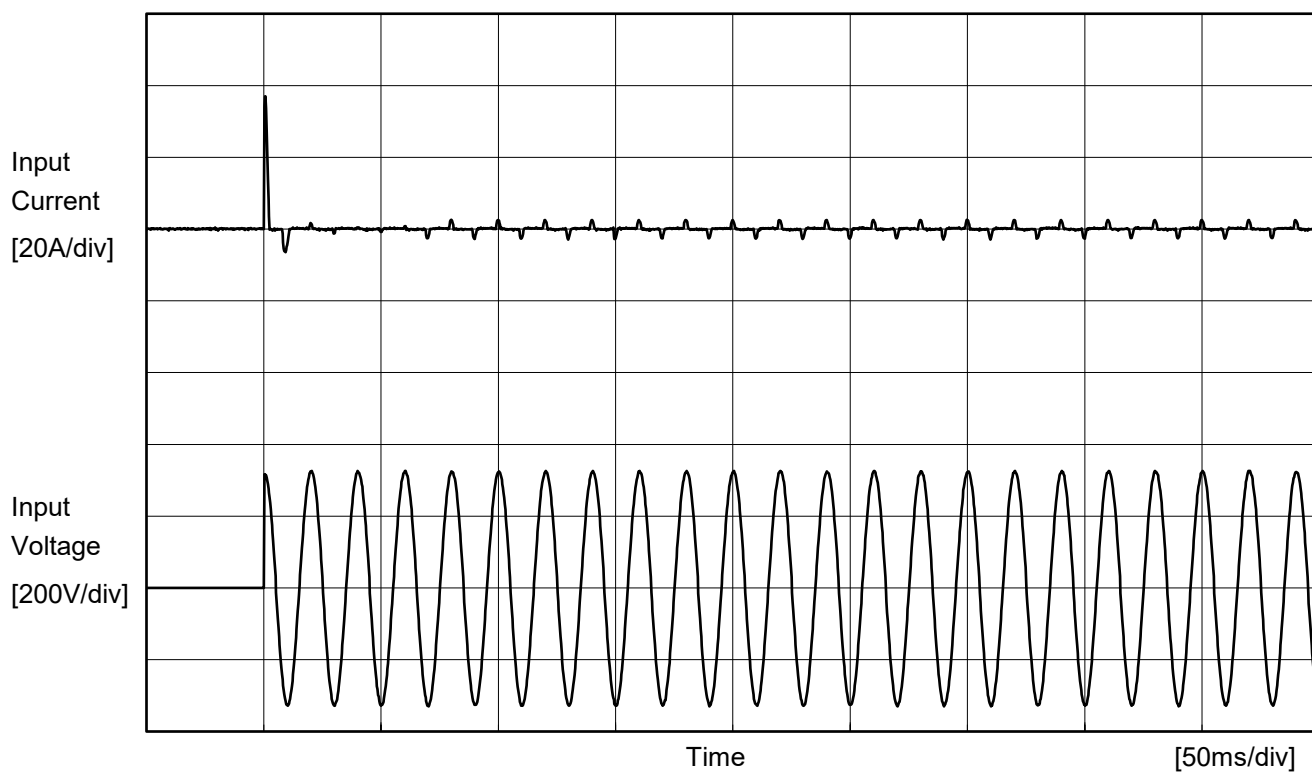
(Final Page 15)

Model					WDA90F-48																																																				
Item					Input Current (by Load Current)																																																				
Object					+48V1.9A																																																				
1.Graph					2.Values																																																				
<div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div>Input Volt.</div><div>Input Volt.</div><div>Input Volt.</div></div><div><div>115V</div><div>230V</div><div>264V</div></div></div> <table><thead><tr><th>Load Current [A]</th><th>Input Current [A] 115V</th><th>Input Current [A] 230V</th><th>Input Current [A] 264V</th></tr></thead><tbody><tr><td>0.00</td><td>0.044</td><td>0.078</td><td>0.088</td></tr><tr><td>0.38</td><td>0.391</td><td>0.262</td><td>0.243</td></tr><tr><td>0.76</td><td>0.680</td><td>0.425</td><td>0.386</td></tr><tr><td>1.14</td><td>0.961</td><td>0.588</td><td>0.532</td></tr><tr><td>1.52</td><td>1.241</td><td>0.754</td><td>0.680</td></tr><tr><td>1.90</td><td>1.522</td><td>0.921</td><td>0.833</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></tbody></table>					Load Current [A]	Input Current [A] 115V	Input Current [A] 230V	Input Current [A] 264V	0.00	0.044	0.078	0.088	0.38	0.391	0.262	0.243	0.76	0.680	0.425	0.386	1.14	0.961	0.588	0.532	1.52	1.241	0.754	0.680	1.90	1.522	0.921	0.833	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-					
Load Current [A]	Input Current [A] 115V	Input Current [A] 230V	Input Current [A] 264V																																																						
0.00	0.044	0.078	0.088																																																						
0.38	0.391	0.262	0.243																																																						
0.76	0.680	0.425	0.386																																																						
1.14	0.961	0.588	0.532																																																						
1.52	1.241	0.754	0.680																																																						
1.90	1.522	0.921	0.833																																																						
--	-	-	-																																																						
--	-	-	-																																																						
--	-	-	-																																																						
--	-	-	-																																																						
--	-	-	-																																																						

Model		WDA90F-48		Temperature 25°C Testing Circuitry Figure A																																																				
Item		Efficiency (by Load Current)																																																						
Object		+48V1.9A																																																						
1.Graph		<div><div><div>—△—</div>Input Volt. 115V</div><div><div>---□---</div>Input Volt. 230V</div><div><div>---○---</div>Input Volt. 264V</div></div>		2.Values																																																				
<div><div>Efficiency [%]</div><div><div>100</div><div>92</div><div>84</div><div>76</div><div>68</div><div>60</div></div><div><div>0</div><div>0.5</div><div>1</div><div>1.5</div><div>2</div></div><div>Load Current [A]</div></div>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Efficiency [%]</th></tr><tr><th>Input Volt. 115[V]</th><th>Input Volt. 230[V]</th><th>Input Volt. 264[V]</th></tr><tr><td>0.00</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.38</td><td>87.3</td><td>82.0</td><td>79.5</td></tr><tr><td>0.76</td><td>89.1</td><td>88.0</td><td>86.7</td></tr><tr><td>1.14</td><td>89.2</td><td>89.5</td><td>88.7</td></tr><tr><td>1.52</td><td>89.3</td><td>90.1</td><td>89.9</td></tr><tr><td>1.90</td><td>89.1</td><td>90.6</td><td>90.3</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Efficiency [%]			Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]	0.00	-	-	-	0.38	87.3	82.0	79.5	0.76	89.1	88.0	86.7	1.14	89.2	89.5	88.7	1.52	89.3	90.1	89.9	1.90	89.1	90.6	90.3	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Efficiency [%]																																																							
	Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]																																																					
0.00	-	-	-																																																					
0.38	87.3	82.0	79.5																																																					
0.76	89.1	88.0	86.7																																																					
1.14	89.2	89.5	88.7																																																					
1.52	89.3	90.1	89.9																																																					
1.90	89.1	90.6	90.3																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					

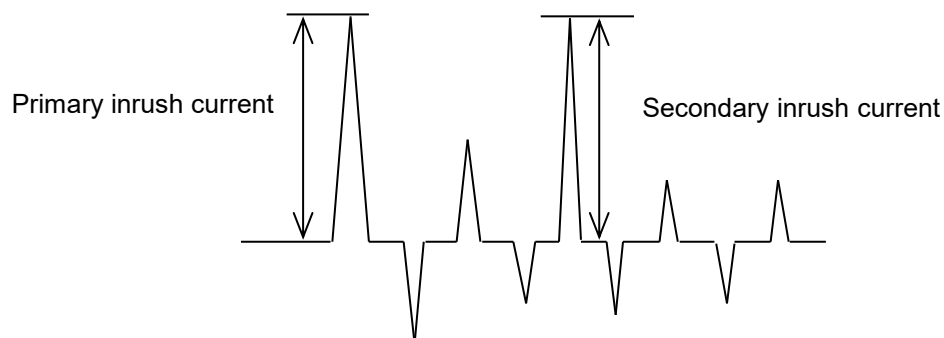
Model		WDA90F-48		Temperature Testing Circuitry	25°C Figure A																																																			
Item		Power Factor (by Load Current)																																																						
Object		+48V1.9A																																																						
1.Graph		<div><div><div>—△—</div>Input Volt. 115V</div><div><div>---□---</div>Input Volt. 230V</div><div><div>-·-○-·-</div>Input Volt. 264V</div></div> <table><thead><tr><th>Load Current [A]</th><th>115V</th><th>230V</th><th>264V</th></tr></thead><tbody><tr><td>0.00</td><td>0.104</td><td>0.045</td><td>0.041</td></tr><tr><td>0.38</td><td>0.463</td><td>0.367</td><td>0.356</td></tr><tr><td>0.76</td><td>0.522</td><td>0.423</td><td>0.412</td></tr><tr><td>1.14</td><td>0.553</td><td>0.451</td><td>0.438</td></tr><tr><td>1.52</td><td>0.571</td><td>0.466</td><td>0.452</td></tr><tr><td>1.90</td><td>0.584</td><td>0.475</td><td>0.459</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></tbody></table>		Load Current [A]	115V	230V	264V	0.00	0.104	0.045	0.041	0.38	0.463	0.367	0.356	0.76	0.522	0.423	0.412	1.14	0.553	0.451	0.438	1.52	0.571	0.466	0.452	1.90	0.584	0.475	0.459	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	2.Values				
Load Current [A]	115V	230V	264V																																																					
0.00	0.104	0.045	0.041																																																					
0.38	0.463	0.367	0.356																																																					
0.76	0.522	0.423	0.412																																																					
1.14	0.553	0.451	0.438																																																					
1.52	0.571	0.466	0.452																																																					
1.90	0.584	0.475	0.459																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
		<table><thead><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Power Factor</th></tr><tr><th>Input Volt. 115[V]</th><th>Input Volt. 230[V]</th><th>Input Volt. 264[V]</th></tr></thead><tbody><tr><td>0.00</td><td>0.104</td><td>0.045</td><td>0.041</td></tr><tr><td>0.38</td><td>0.463</td><td>0.367</td><td>0.356</td></tr><tr><td>0.76</td><td>0.522</td><td>0.423</td><td>0.412</td></tr><tr><td>1.14</td><td>0.553</td><td>0.451</td><td>0.438</td></tr><tr><td>1.52</td><td>0.571</td><td>0.466</td><td>0.452</td></tr><tr><td>1.90</td><td>0.584</td><td>0.475</td><td>0.459</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></tbody></table>				Load Current [A]	Power Factor			Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]	0.00	0.104	0.045	0.041	0.38	0.463	0.367	0.356	0.76	0.522	0.423	0.412	1.14	0.553	0.451	0.438	1.52	0.571	0.466	0.452	1.90	0.584	0.475	0.459	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Power Factor																																																							
	Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]																																																					
0.00	0.104	0.045	0.041																																																					
0.38	0.463	0.367	0.356																																																					
0.76	0.522	0.423	0.412																																																					
1.14	0.553	0.451	0.438																																																					
1.52	0.571	0.466	0.452																																																					
1.90	0.584	0.475	0.459																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					
--	-	-	-																																																					

Model	WDA90F-48	Temperature 25°C Testing Circuitry Figure A
Item	Inrush Current	
Object	+48V1.9A	



Input Voltage	230 V
Frequency	50 Hz
Load	100 %

Primary inrush current	36.9 A
Secondary inrush current	0.0 A



		Temperature 25°C Testing Circuitry Figure C
Model	WDA90F-48	
Item	Leakage Current	
Object	+48V1.9A	

1.Results

[mA]

Standards	Testing Circuitry	Measuring Method	Input Volt.			Note
			115 [V]	240 [V]	264 [V]	
DEN-AN	Figure C-1	Both phases	0.20	0.44	0.49	Operation
		One of phases	0.36	0.79	0.87	Stand by
IEC62368-1	Figure C-2	Both phases	0.19	0.42	0.46	Operation
		One of phases	0.35	0.76	0.84	Stand by
	Figure C-3	Both phases	0.19	0.41	0.45	Operation
		One of phases	0.34	0.74	0.82	Stand by

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

2.Condition

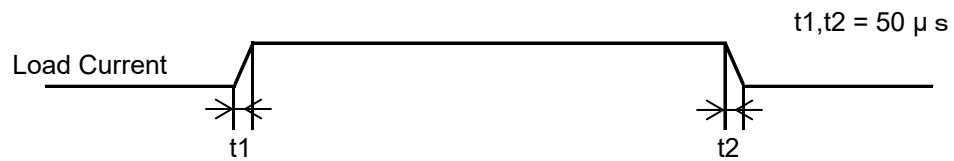
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

Model		WDA90F-48	
Item		Line Regulation	
Object		+48V1.9A	
1.Graph		2.Values	
<div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><</div></div></div></div>			

Model	WDA90F-48																																																					
Item	Load Regulation	Temperature	25°C																																																			
Object	+48V1.9A	Testing Circuitry	Figure A																																																			
1.Graph		2.Values																																																				
<div><div><div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div>Input Volt. 115V</div><div>Input Volt. 230V</div><div>Input Volt. 264V</div></div></div><div><div><div>Output Voltage [V]</div><div>49.00</div><div>48.80</div><div>48.60</div><div>48.40</div><div>48.20</div><div>48.00</div><div>47.80</div><div>47.60</div></div><div><div>0</div><div>0.5</div><div>1</div><div>1.5</div><div>2</div></div><div>Load Current [A]</div></div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 115[V]</th><th>Input Volt. 230[V]</th><th>Input Volt. 264[V]</th></tr><tr><td>0.00</td><td>48.034</td><td>48.040</td><td>48.041</td></tr><tr><td>0.38</td><td>48.032</td><td>48.032</td><td>48.032</td></tr><tr><td>0.76</td><td>48.031</td><td>48.031</td><td>48.030</td></tr><tr><td>1.14</td><td>48.030</td><td>48.030</td><td>48.029</td></tr><tr><td>1.52</td><td>48.029</td><td>48.029</td><td>48.028</td></tr><tr><td>1.90</td><td>48.029</td><td>48.027</td><td>48.027</td></tr><tr><td>--</td><td>--</td><td>--</td><td>--</td></tr><tr><td>--</td><td>--</td><td>--</td><td>--</td></tr><tr><td>--</td><td>--</td><td>--</td><td>--</td></tr><tr><td>--</td><td>--</td><td>--</td><td>--</td></tr><tr><td>--</td><td>--</td><td>--</td><td>--</td></tr></table>		Load Current [A]	Output Voltage [V]			Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]	0.00	48.034	48.040	48.041	0.38	48.032	48.032	48.032	0.76	48.031	48.031	48.030	1.14	48.030	48.030	48.029	1.52	48.029	48.029	48.028	1.90	48.029	48.027	48.027	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Load Current [A]	Output Voltage [V]																																																					
	Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]																																																			
0.00	48.034	48.040	48.041																																																			
0.38	48.032	48.032	48.032																																																			
0.76	48.031	48.031	48.030																																																			
1.14	48.030	48.030	48.029																																																			
1.52	48.029	48.029	48.028																																																			
1.90	48.029	48.027	48.027																																																			
--	--	--	--																																																			
--	--	--	--																																																			
--	--	--	--																																																			
--	--	--	--																																																			
--	--	--	--																																																			
Item	Ripple-Noise	Temperature	25°C																																																			
Object	+48V1.9A	Testing Circuitry	Figure B																																																			
1.Graph																																																						
<div><div><div>Input Voltage230V</div><div>Load100%</div></div><div><div><div>20[mV/div]</div><div>10[ms/div]</div></div></div></div>																																																						

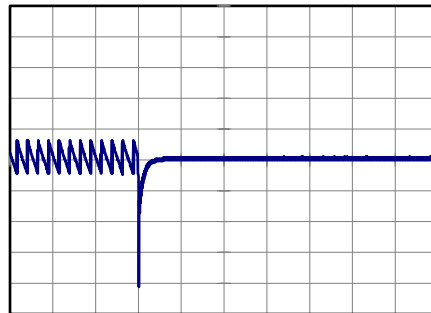
Model	WDA90F-48	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+48V1.9A	

Input Volt. 230 V
Cycle 1000 ms

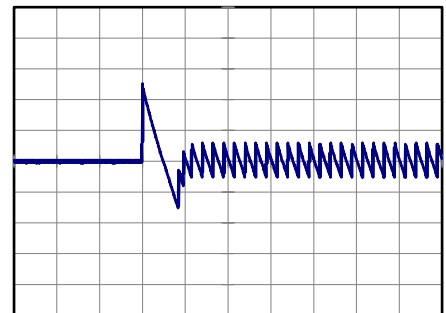


Min.Load (0A) ←→
Load 100% (1.9A)

100 mV/div



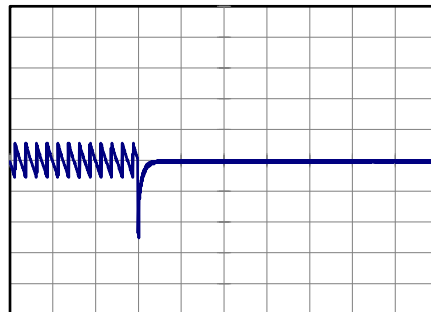
40 ms/div



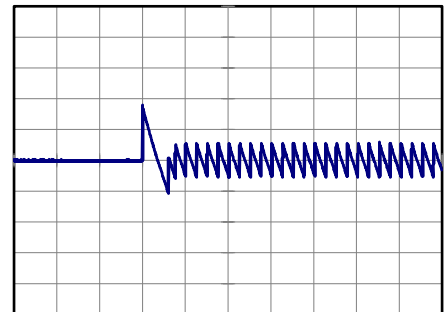
40 ms/div

Min.Load (0A) ←→
Load 50% (0.95A)

100 mV/div



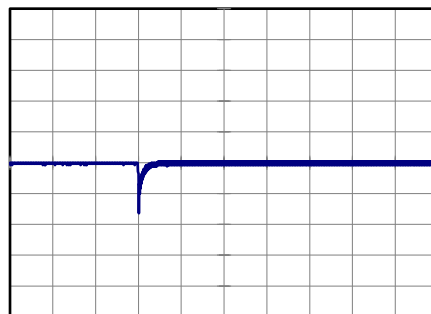
40 ms/div



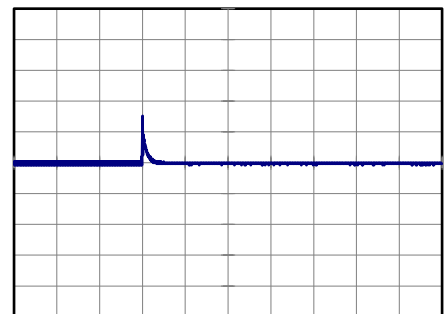
40 ms/div

Load 50% (0.95A) ←→
Load 100% (1.9A)

100 mV/div



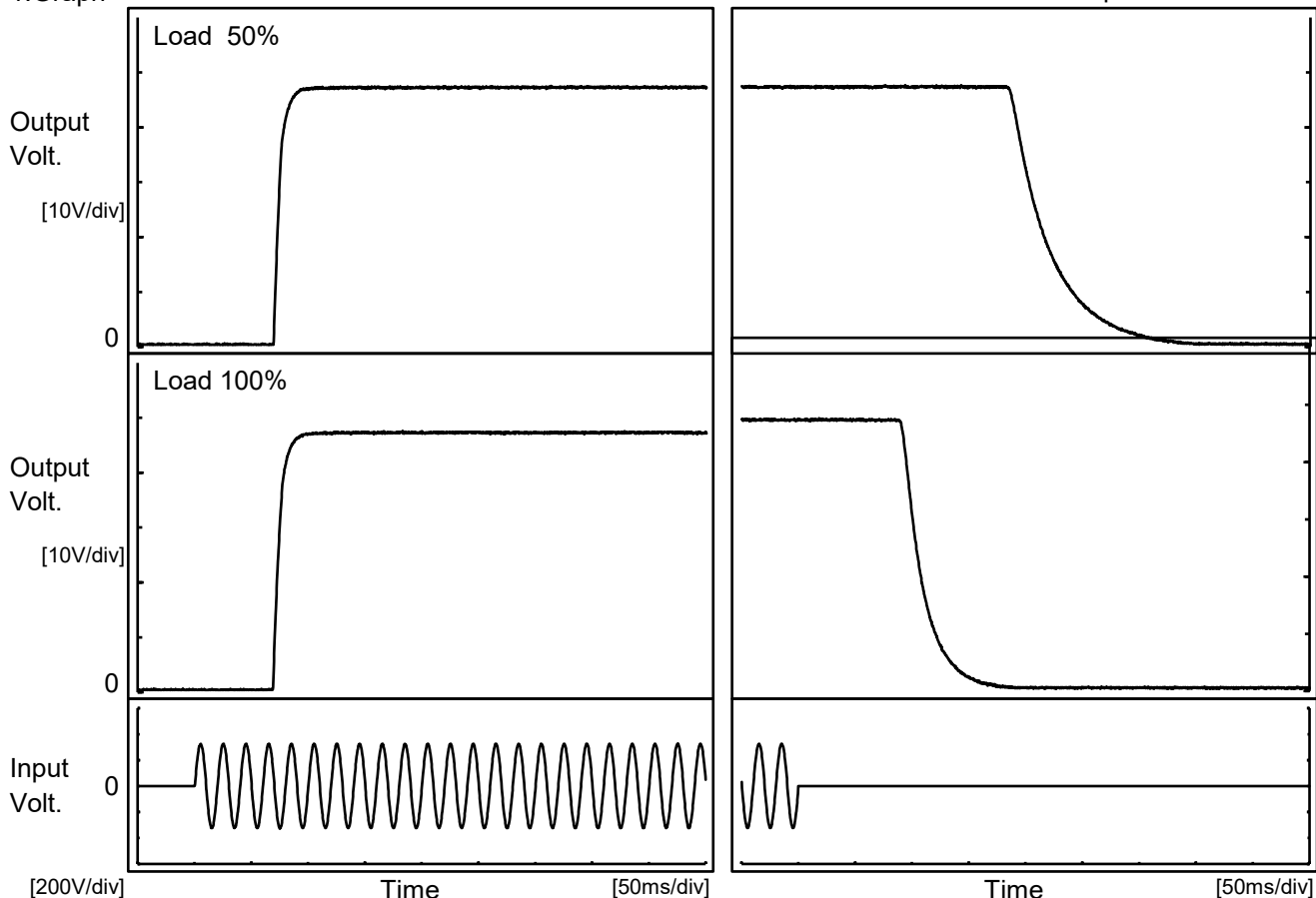
40 ms/div



40 ms/div

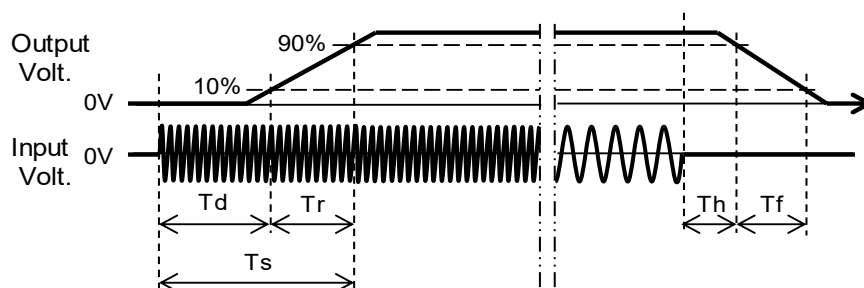
Model	WDA90F-48	Temperature 25°C Testing Circuitry Figure A
Item	Rise and Fall Time	
Object	+48V1.9A	

1.Graph



2.Values

		[ms]				
Load	Time	Td	Tr	Ts	Th	Tf
50 %		70.3	12.8	83.1	189.3	76.3
100 %		69.8	12.8	82.6	92.8	40.8



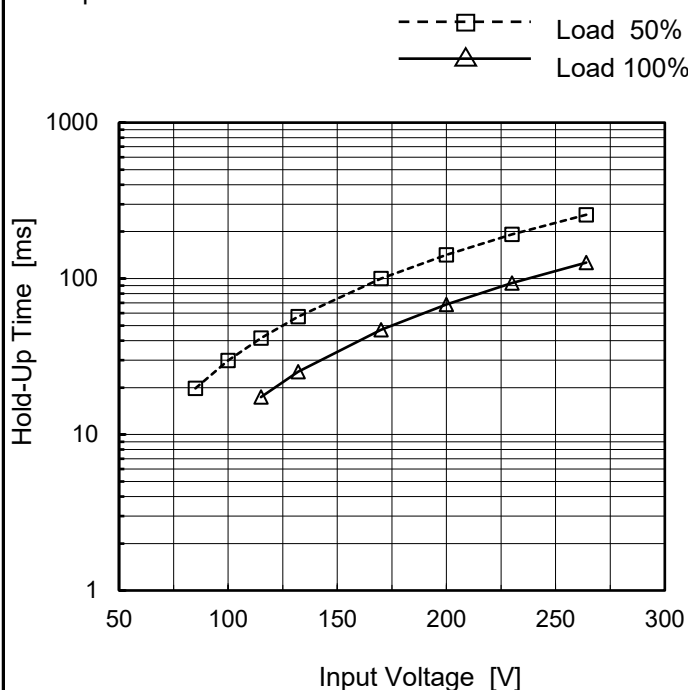
Model WDA90F-48

Item Hold-Up Time

Object +48V1.9A

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	20	-
100	30	-
115	42	17
132	57	25
170	100	47
200	142	68
230	192	94
264	257	127
--	-	-

Model		WDA90F-48		Temperature 25°C Testing Circuitry Figure A																																																						
Item		Instantaneous Interruption Compensation																																																								
Object		+48V1.9A																																																								
1.Graph		<div><div><div>—△—</div><div>Input Volt.</div><div>115V</div></div><div><div>- - □ - -</div><div>Input Volt.</div><div>230V</div></div><div><div>- · - ○ - · -</div><div>Input Volt.</div><div>264V</div></div></div>		2.Values																																																						
<div><div>Instantaneous Compensation Time [ms]</div><div><div><div><div></div><div></div><div></div></div><div><div>1000</div><div>100</div><div>10</div><div>1</div></div><div><div>0</div><div>0.5</div><div>1</div><div>1.5</div><div>2</div></div><div>Load Current [A]</div></div></div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Time [ms]</th></tr><tr><th>Input Volt. 115[V]</th><th>Input Volt. 230[V]</th><th>Input Volt. 264[V]</th></tr><tr><td>0.00</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.38</td><td>115</td><td>478</td><td>628</td></tr><tr><td>0.76</td><td>56</td><td>244</td><td>325</td></tr><tr><td>1.14</td><td>36</td><td>163</td><td>218</td></tr><tr><td>1.52</td><td>25</td><td>121</td><td>162</td></tr><tr><td>1.90</td><td>18</td><td>95</td><td>128</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Time [ms]			Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]	0.00	-	-	-	0.38	115	478	628	0.76	56	244	325	1.14	36	163	218	1.52	25	121	162	1.90	18	95	128	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
		Load Current [A]	Time [ms]																																																							
			Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]																																																					
		0.00	-	-	-																																																					
		0.38	115	478	628																																																					
		0.76	56	244	325																																																					
		1.14	36	163	218																																																					
		1.52	25	121	162																																																					
		1.90	18	95	128																																																					
		--	-	-	-																																																					
		--	-	-	-																																																					
		--	-	-	-																																																					
		--	-	-	-																																																					
		--	-	-	-																																																					
--	-	-	-																																																							

Model	WDA90F-48	Temperature 25°C Testing Circuitry Figure A																																																																
Item	Overcurrent Protection																																																																	
Object	+48V1.9A																																																																	
1.Graph		2.Values																																																																
<div><div><div></div><div>Input Volt. 115V</div></div><div><div></div><div>Input Volt. 230V</div></div><div><div></div><div>Input Volt. 264V</div></div></div> <p>Note: Slanted line shows the range of the rated load current.</p>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="3">Load Current [A]</th></tr><tr><th>Input Volt. 115[V]</th><th>Input Volt. 230[V]</th><th>Input Volt. 264[V]</th></tr><tr><td>48</td><td>2.74</td><td>2.95</td><td>3.01</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]			Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]	48	2.74	2.95	3.01	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Output Voltage [V]	Load Current [A]																																																																	
	Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]																																																															
48	2.74	2.95	3.01																																																															
--	-	-	-																																																															
--	-	-	-																																																															
--	-	-	-																																																															
--	-	-	-																																																															
--	-	-	-																																																															
--	-	-	-																																																															
--	-	-	-																																																															
--	-	-	-																																																															
--	-	-	-																																																															
--	-	-	-																																																															
--	-	-	-																																																															
--	-	-	-																																																															
--	-	-	-																																																															

		Testing Circuitry Figure A
Model	WDA90F-48	
Item	Ambient Temperature Drift	
Object	+48V1.9A	

1.Values

Load 100%

Ambient Temperature[°C]	Output Voltage [V]		
	Input Volt. 115V	Input Volt. 230V	Input Volt. 264V
-20	47.923	47.923	47.925
25	48.021	48.021	48.021
50	48.028	48.030	48.030

Item	Minimum Input Voltage for Regulated Output Voltage	Testing Circuitry Figure A
Object	+48V1.9A	

1.Values

Ambient Temperature[°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	41	67
25	41	66
50	41	66

Item	Overvoltage Protection	Testing Circuitry Figure A
Object	+48V1.9A	

1.Values

Load 0%

Ambient Temperature[°C]	Operating Point [V]	
	Input Volt. 115V	Input Volt. 264V
-20	59.02	59.02
25	57.84	60.71
50	61.81	61.96

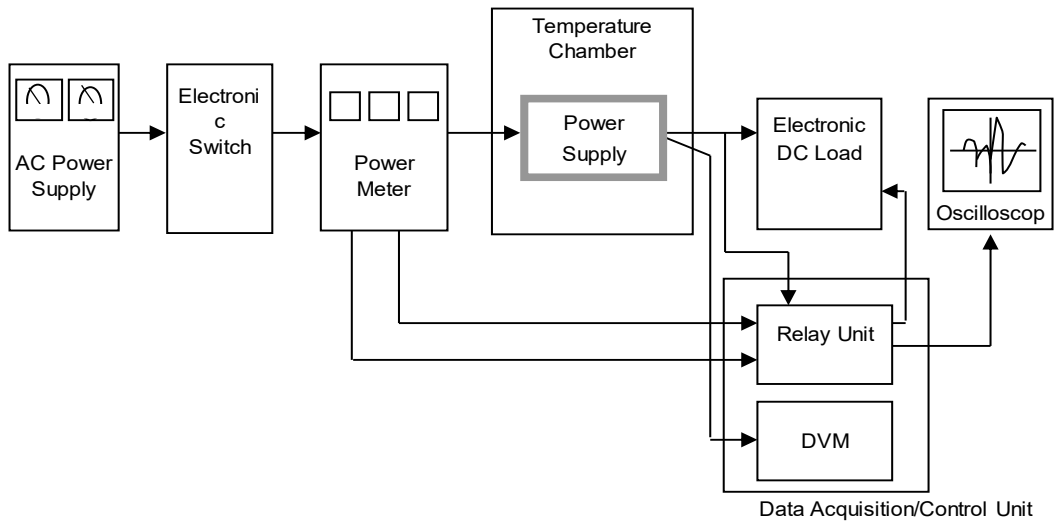
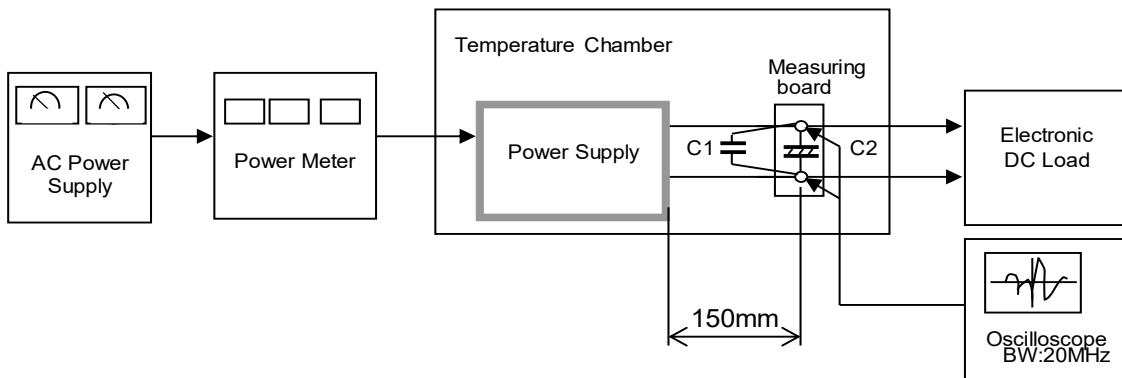


Figure A



$C1 = 0.1 \mu F$
(Ceramic capacitor)

$C2 = 47 \mu F$
(Electrolytic capacitor)

Figure B

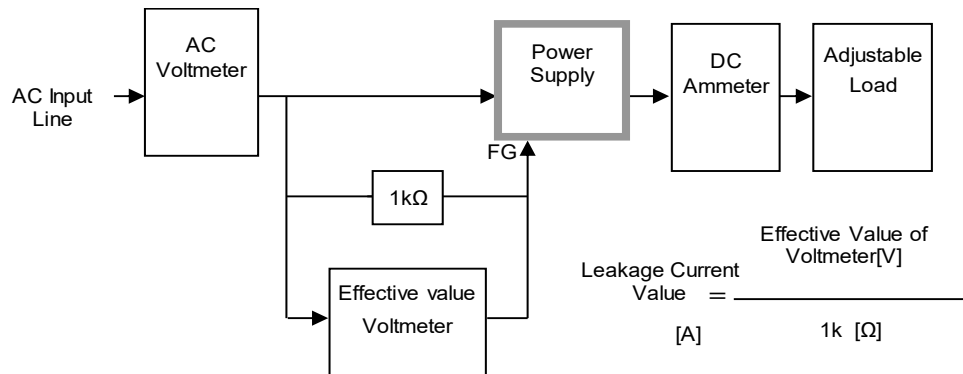


Figure C-1 (DEN-AN)

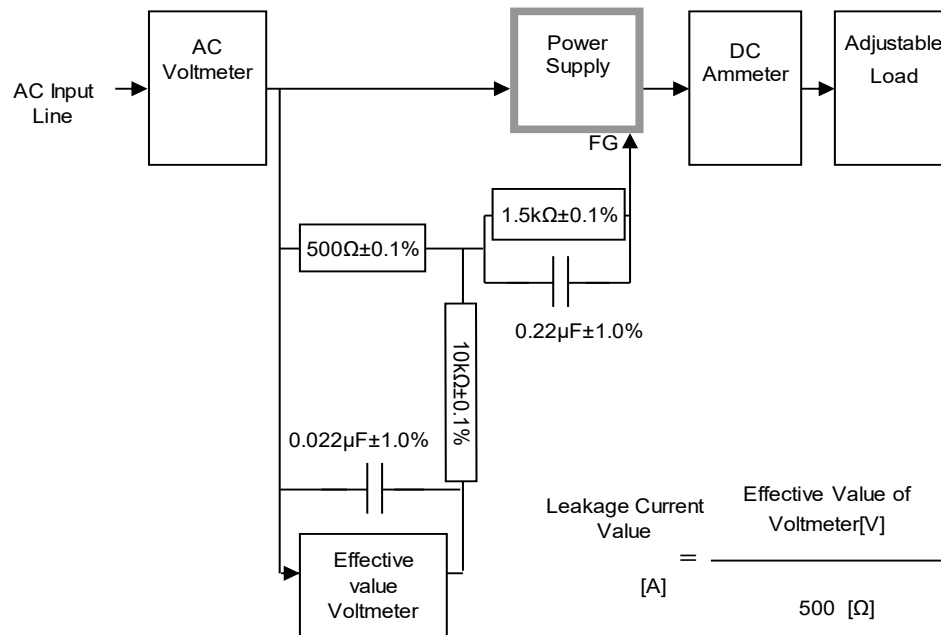


Figure C-2 (IEC62368-1 refer to IEC60990 Fig.4)

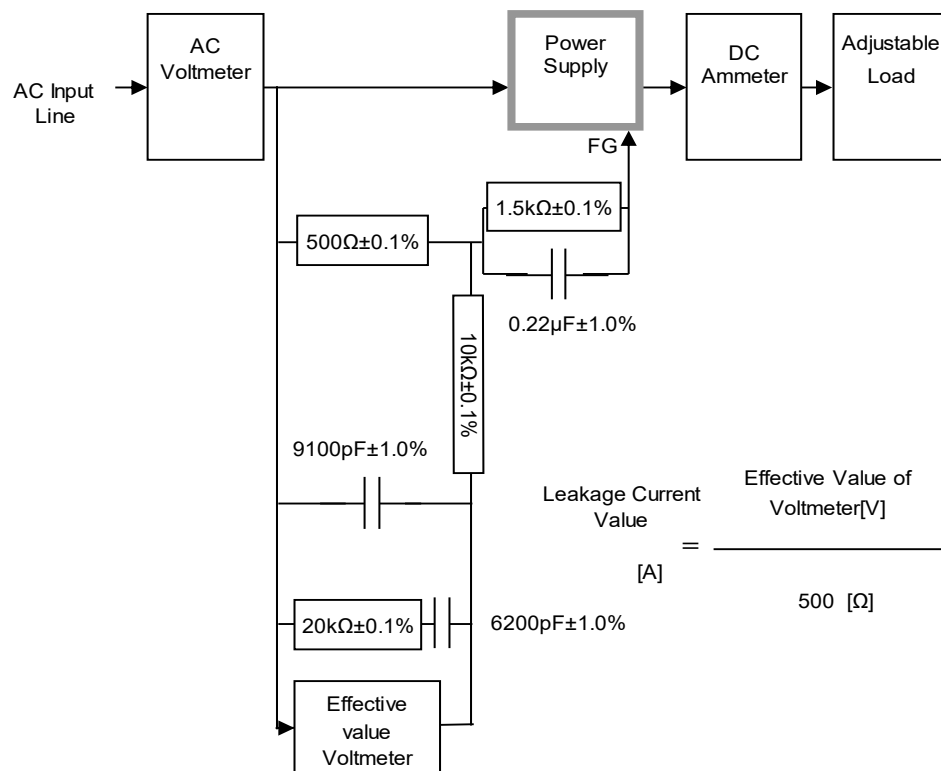


Figure C-3 (IEC62368-1 refer to IEC60990 Fig.5)