

# TEST DATA OF UMPS60F12-E

Regulated DC Power Supply  
July 18, 2024

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Design Manager

Prepared by : Kyosuke Kurata  
Design Engineer

**COSEL CO.,LTD.**

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(Final Page 15)

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Model		UMPS60F12-E	Temperature Testing Circuitry	25°C Figure A																																																		
Item		Input Current (by Load Current)																																																				
Object		+12V4.5A																																																				
1.Graph		<div><div>—△—</div>Input Volt. 115V</div> <div><div>---□---</div>Input Volt. 230V</div> <div><div>---○---</div>Input Volt. 264V</div> <p>Input Current [A]</p> <p>Load Current [A]</p>	2.Values																																																			
		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input 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>0.0</td><td>0.013</td><td>0.023</td><td>0.026</td></tr><tr><td>0.9</td><td>0.252</td><td>0.158</td><td>0.142</td></tr><tr><td>1.8</td><td>0.436</td><td>0.273</td><td>0.246</td></tr><tr><td>2.7</td><td>0.613</td><td>0.379</td><td>0.337</td></tr><tr><td>3.6</td><td>0.784</td><td>0.479</td><td>0.430</td></tr><tr><td>4.5</td><td>0.957</td><td>0.585</td><td>0.530</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]	Input Current [A]			Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]	0.0	0.013	0.023	0.026	0.9	0.252	0.158	0.142	1.8	0.436	0.273	0.246	2.7	0.613	0.379	0.337	3.6	0.784	0.479	0.430	4.5	0.957	0.585	0.530	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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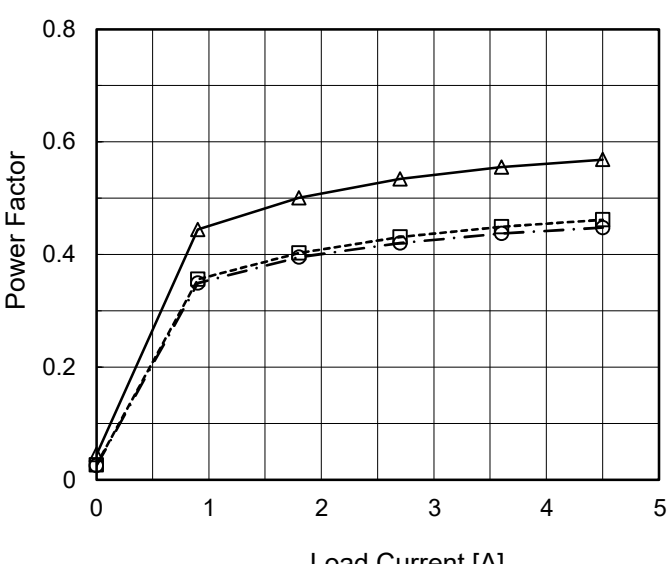
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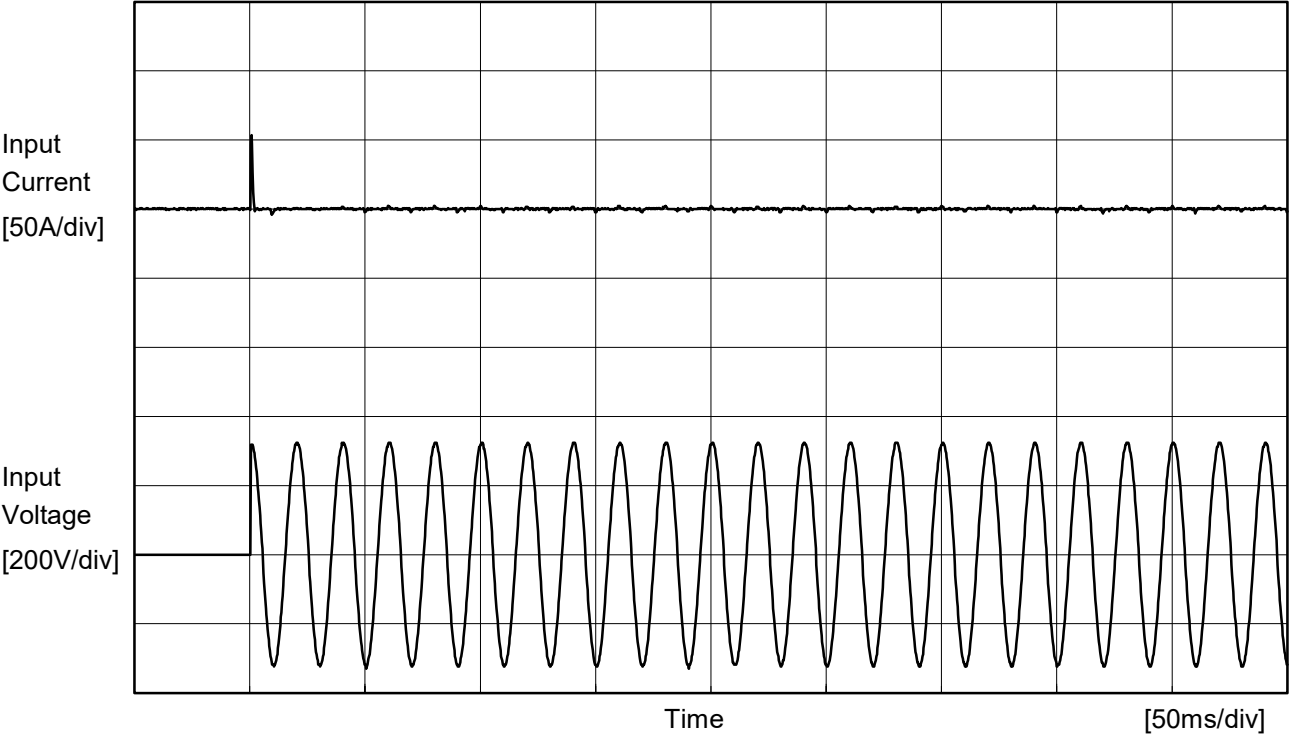
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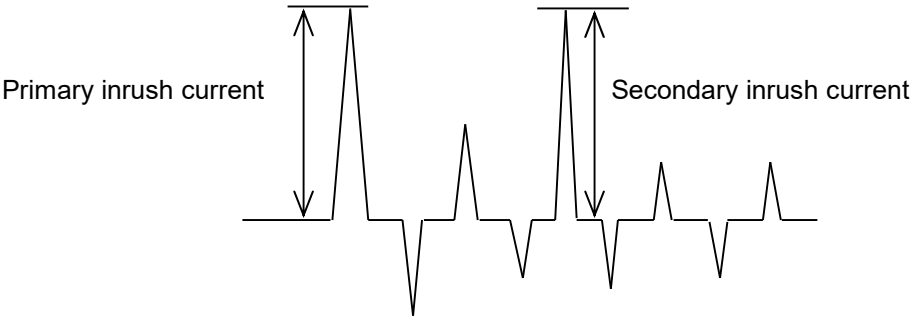
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Model		UMPS60F12-E	Temperature 25°C Testing Circuitry Figure A
Item		Inrush Current	
Object		+12V4.5A	



Input Voltage	230 V
Frequency	50 Hz
Load	100 %
Primary inrush current	53.7 A
Secondary inrush current	3.1 A





COSEL		Temperature 25°C Testing Circuitry Figure C
Model	UMPS60F12-E	
Item	Leakage Current	
Object	+12V4.5A	

## 1.Results

Standards	Testing Circuitry	Measuring Method	Input Volt.			Note
			115 [V]	230 [V]	264 [V]	
IEC60601-1	Figure C-1	Both phases	1.9	4.0	3.9	Operation
		One of phases	3.0	6.2	7.2	Stand by
IEC62368-1	Figure C-2	Both phases	1.0	3.6	4.3	Operation
		One of phases	2.6	5.9	6.8	Stand by
	Figure C-3	Both phases	1.0	3.6	4.3	Operation
		One of phases	2.6	5.9	6.8	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.

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Item	Line Regulation	Temperature	25°C																																
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Object	+12V4.5A																																		
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<div><div>Input Voltage 230V</div><div>Load 100%</div></div> <div><div>20[mV/div]</div><div><div></div></div><div>10[ms/div]</div></div>																																																						

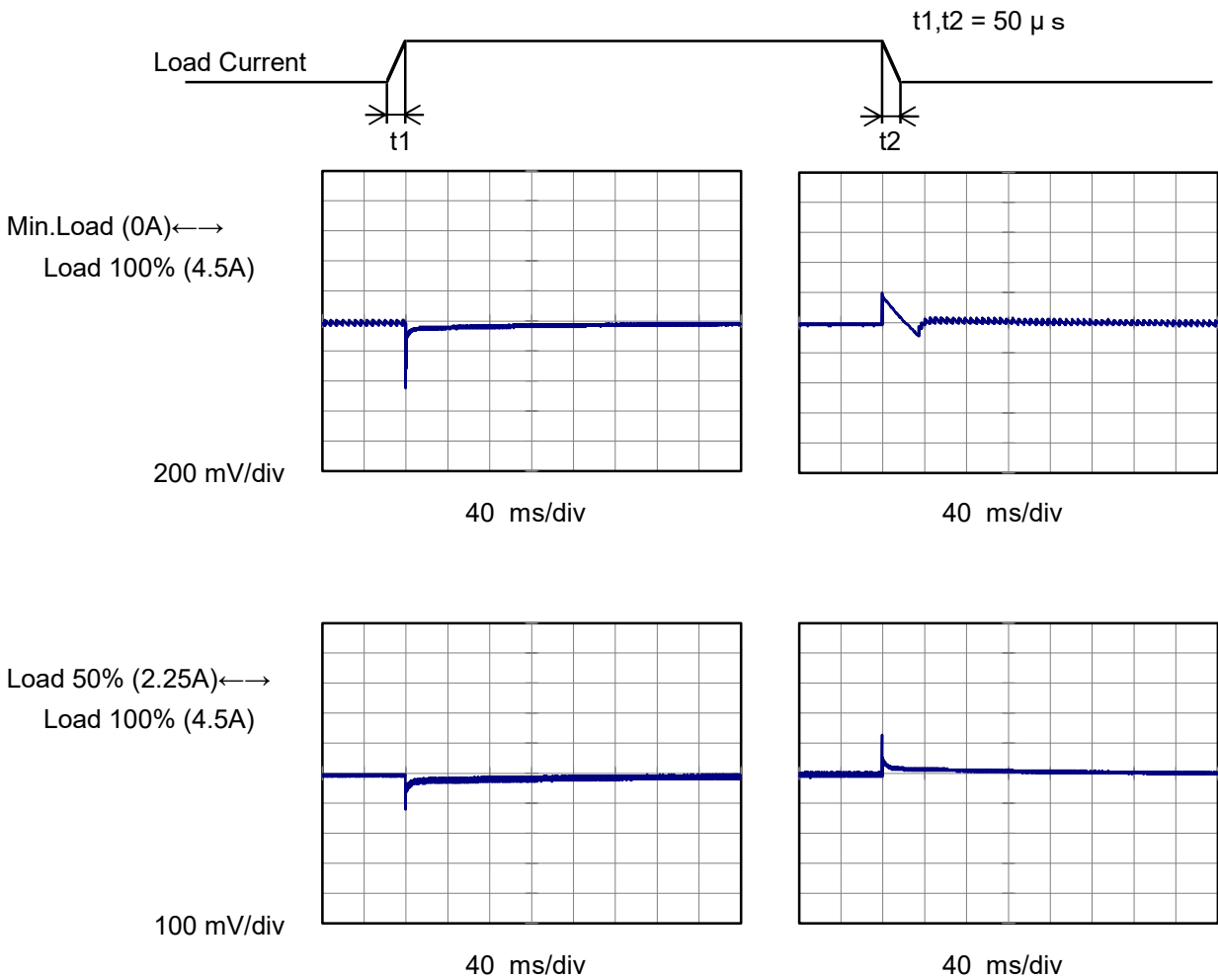
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Model	UMPS60F12-E		
Item	Dynamic Load Response	Temperature	25°C
		Testing Circuitry	Figure A
Object	+12V4.5A		

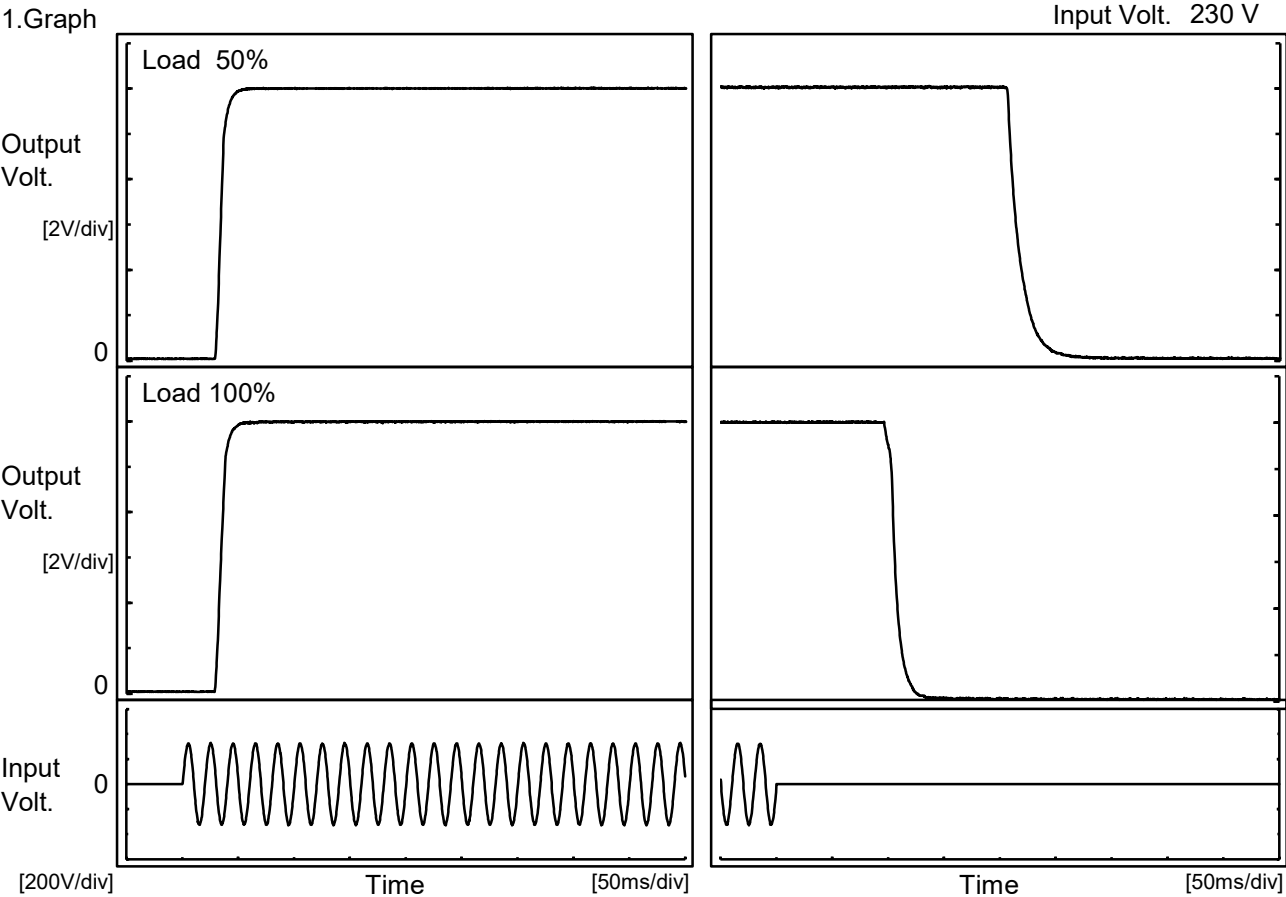
Input Volt.     230 V  
Cycle            1000 ms





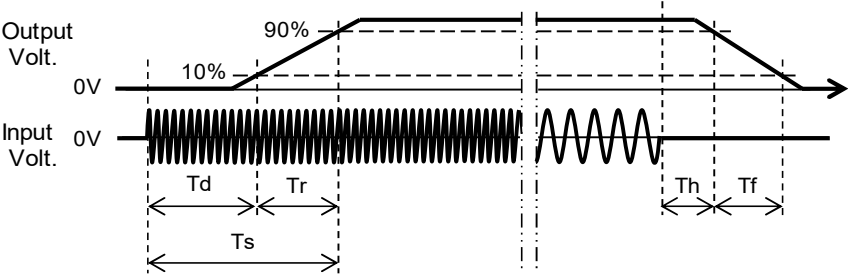
Model		UMPS60F12-E	Temperature     25°C Testing Circuitry   Figure A
Item		Rise and Fall Time	
Object		+12V4.5A	

1.Graph



2.Values

		[ms]				
Load \ Time		Td	Tr	Ts	Th	Tf
50 %		31.0	9.0	40.0	207.3	24.8
100 %		30.8	9.5	40.3	101.0	14.8



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Item	Hold-Up Time	Temperature	25°C																																
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<div>This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.</div>																																			

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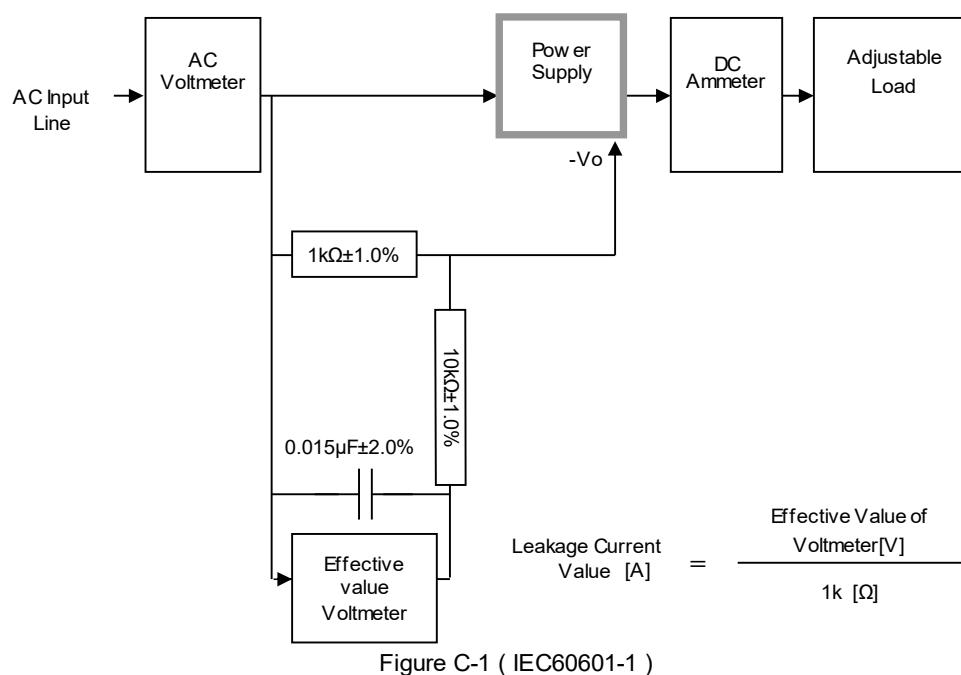
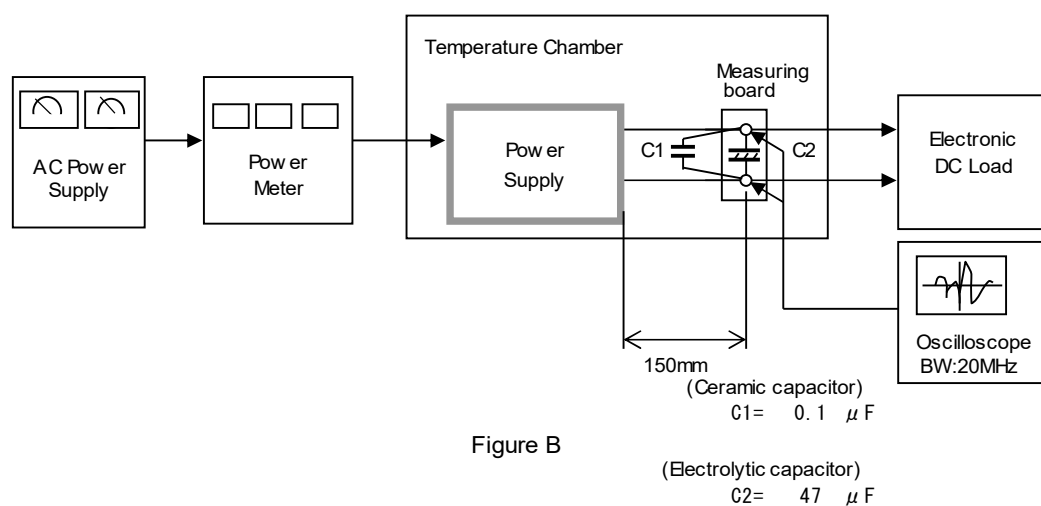
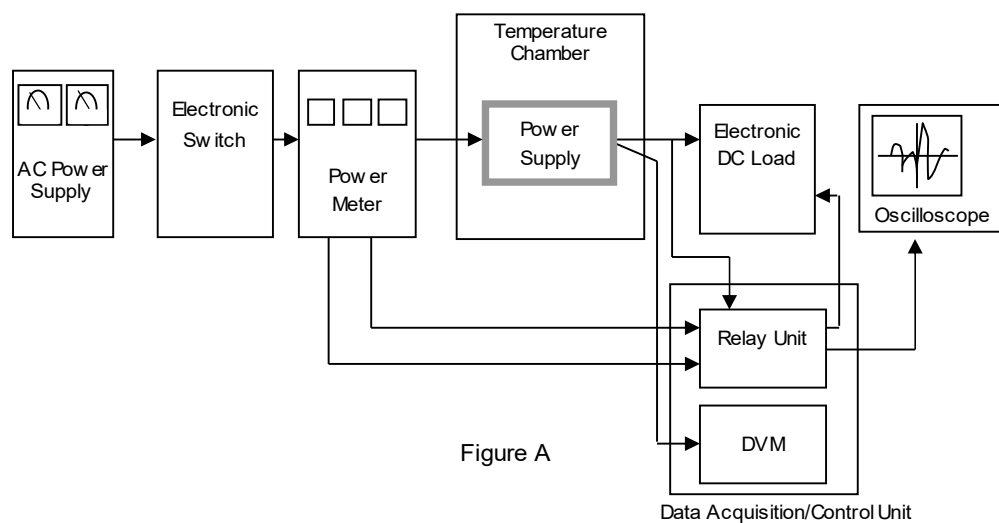
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Object		+12V4.5A			
1.Graph					
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		—	Input Volt.	264V	
<div><div><div>Output Voltage [V]</div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><di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**COSEL**

		Testing Circuitry    Figure A																			
Model	UMPS60F12-E																				
Item	Ambient Temperature Drift																				
Object	+12V4.5A																				
1.Values <div>Load 100%</div> <table><tr><th rowspan="2">Ambient Temperature[°C]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 115V</th><th>Input Volt. 230V</th><th>Input Volt. 264V</th></tr><tr><td>-20</td><td>12.003</td><td>12.003</td><td>12.005</td></tr><tr><td>25</td><td>12.049</td><td>12.049</td><td>12.050</td></tr><tr><td>30</td><td>12.059</td><td>12.059</td><td>12.059</td></tr></table>			Ambient Temperature[°C]	Output Voltage [V]			Input Volt. 115V	Input Volt. 230V	Input Volt. 264V	-20	12.003	12.003	12.005	25	12.049	12.049	12.050	30	12.059	12.059	12.059
Ambient Temperature[°C]	Output Voltage [V]																				
	Input Volt. 115V	Input Volt. 230V	Input Volt. 264V																		
-20	12.003	12.003	12.005																		
25	12.049	12.049	12.050																		
30	12.059	12.059	12.059																		
1.Values <div>Load 100%</div> <table><tr><th rowspan="2">Ambient Temperature[°C]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 115V</th><th>Input Volt. 230V</th><th>Input Volt. 264V</th></tr><tr><td>-20</td><td>12.003</td><td>12.003</td><td>12.005</td></tr><tr><td>25</td><td>12.049</td><td>12.049</td><td>12.050</td></tr><tr><td>30</td><td>12.059</td><td>12.059</td><td>12.059</td></tr></table>			Ambient Temperature[°C]	Output Voltage [V]			Input Volt. 115V	Input Volt. 230V	Input Volt. 264V	-20	12.003	12.003	12.005	25	12.049	12.049	12.050	30	12.059	12.059	12.059
Ambient Temperature[°C]	Output Voltage [V]																				
	Input Volt. 115V	Input Volt. 230V	Input Volt. 264V																		
-20	12.003	12.003	12.005																		
25	12.049	12.049	12.050																		
30	12.059	12.059	12.059																		
		Testing Circuitry    Figure A																			
Item	Minimum Input Voltage for Regulated Output Voltage																				
Object	+12V4.5A																				
1.Values <div>Load 100%</div> <table><tr><th rowspan="2">Ambient Temperature[°C]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 115V</th><th>Input Volt. 230V</th><th>Input Volt. 264V</th></tr><tr><td>-20</td><td>12.003</td><td>12.003</td><td>12.005</td></tr><tr><td>25</td><td>12.049</td><td>12.049</td><td>12.050</td></tr><tr><td>30</td><td>12.059</td><td>12.059</td><td>12.059</td></tr></table>			Ambient Temperature[°C]	Output Voltage [V]			Input Volt. 115V	Input Volt. 230V	Input Volt. 264V	-20	12.003	12.003	12.005	25	12.049	12.049	12.050	30	12.059	12.059	12.059
Ambient Temperature[°C]	Output Voltage [V]																				
	Input Volt. 115V	Input Volt. 230V	Input Volt. 264V																		
-20	12.003	12.003	12.005																		
25	12.049	12.049	12.050																		
30	12.059	12.059	12.059																		
1.Values <div>Load 50%</div> <table><tr><th rowspan="2">Ambient Temperature[°C]</th><th colspan="2">Input Voltage [V]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>-20</td><td>38</td><td>56</td></tr><tr><td>25</td><td>37</td><td>56</td></tr><tr><td>30</td><td>37</td><td>57</td></tr></table>			Ambient Temperature[°C]	Input Voltage [V]		Load 50%	Load 100%	-20	38	56	25	37	56	30	37	57					
Ambient Temperature[°C]	Input Voltage [V]																				
	Load 50%	Load 100%																			
-20	38	56																			
25	37	56																			
30	37	57																			
1.Values <div>Load 50%</div> <table><tr><th rowspan="2">Ambient Temperature[°C]</th><th colspan="2">Input Voltage [V]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>-20</td><td>38</td><td>56</td></tr><tr><td>25</td><td>37</td><td>56</td></tr><tr><td>30</td><td>37</td><td>57</td></tr></table>			Ambient Temperature[°C]	Input Voltage [V]		Load 50%	Load 100%	-20	38	56	25	37	56	30	37	57					
Ambient Temperature[°C]	Input Voltage [V]																				
	Load 50%	Load 100%																			
-20	38	56																			
25	37	56																			
30	37	57																			
		Testing Circuitry    Figure A																			
Item	Overvoltage Protection																				
Object	+12V4.5A																				
1.Values <div>Load 0%</div> <table><tr><th rowspan="2">Ambient Temperature[°C]</th><th colspan="2">Operating Point [V]</th></tr><tr><th>Input Volt. 115V</th><th>Input Volt. 264V</th></tr><tr><td>-20</td><td>14.62</td><td>14.16</td></tr><tr><td>25</td><td>15.03</td><td>14.97</td></tr><tr><td>30</td><td>15.08</td><td>15.08</td></tr></table>			Ambient Temperature[°C]	Operating Point [V]		Input Volt. 115V	Input Volt. 264V	-20	14.62	14.16	25	15.03	14.97	30	15.08	15.08					
Ambient Temperature[°C]	Operating Point [V]																				
	Input Volt. 115V	Input Volt. 264V																			
-20	14.62	14.16																			
25	15.03	14.97																			
30	15.08	15.08																			
1.Values <div>Load 0%</div> <table><tr><th rowspan="2">Ambient Temperature[°C]</th><th colspan="2">Operating Point [V]</th></tr><tr><th>Input Volt. 115V</th><th>Input Volt. 264V</th></tr><tr><td>-20</td><td>14.62</td><td>14.16</td></tr><tr><td>25</td><td>15.03</td><td>14.97</td></tr><tr><td>30</td><td>15.08</td><td>15.08</td></tr></table>			Ambient Temperature[°C]	Operating Point [V]		Input Volt. 115V	Input Volt. 264V	-20	14.62	14.16	25	15.03	14.97	30	15.08	15.08					
Ambient Temperature[°C]	Operating Point [V]																				
	Input Volt. 115V	Input Volt. 264V																			
-20	14.62	14.16																			
25	15.03	14.97																			
30	15.08	15.08																			

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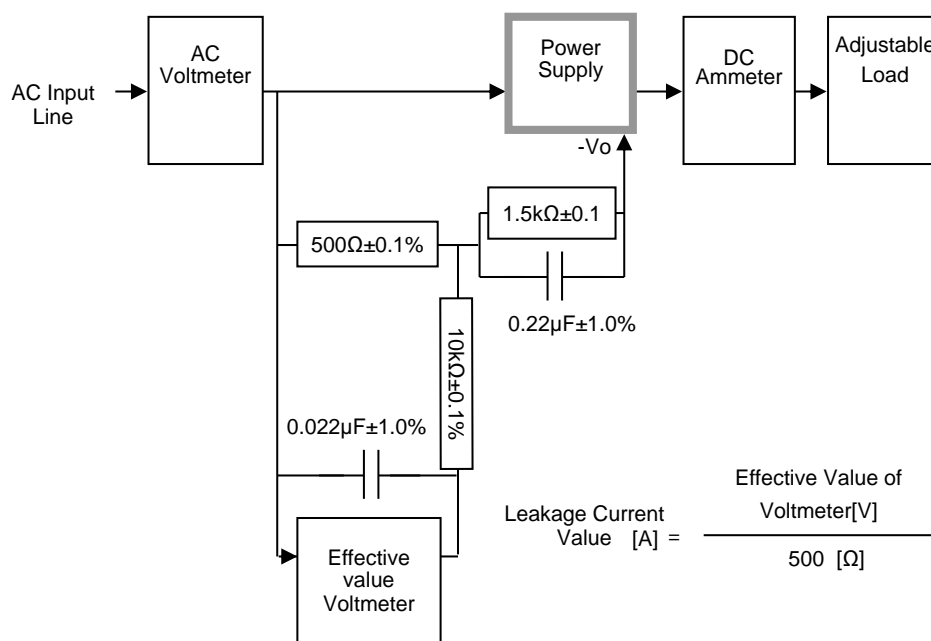


Figure C-2 ( IEC62368-1 refer to IEC60990 Fig.4 )

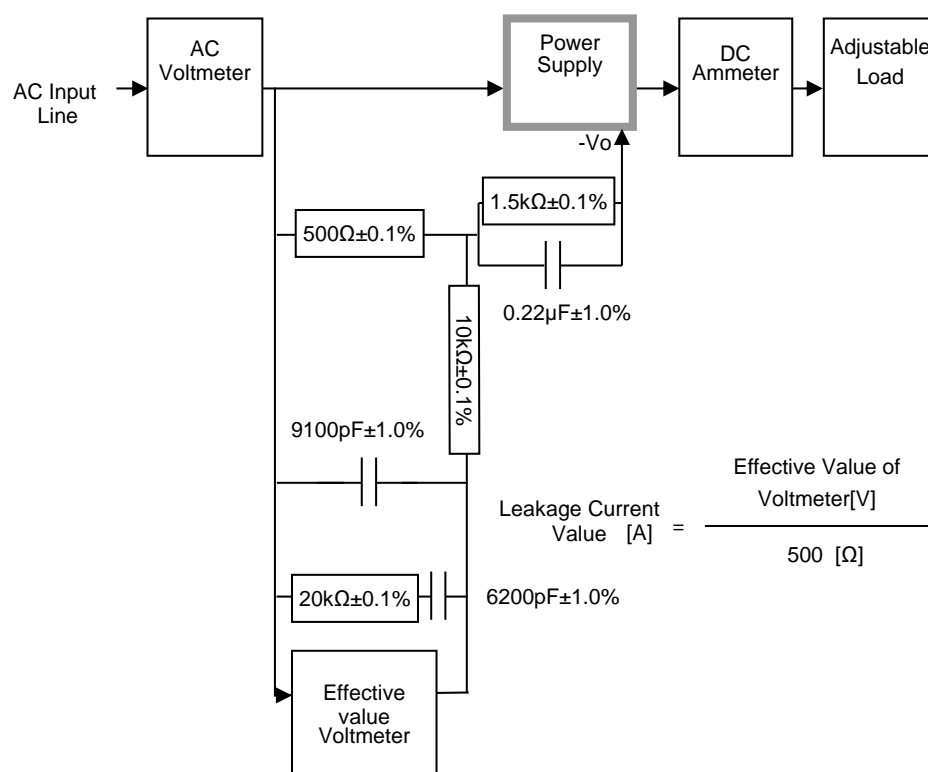


Figure C-3 ( IEC62368-1 refer to IEC60990 Fig.5 )