


# TEST DATA OF PJMA1000F-12

Regulated DC Power Supply  
January 25, 2021

Approved by :   
Takashi Kajii Design Manager

Prepared by :   
Ryo Takahashi Design Engineer

**COSEL CO.,LTD.**

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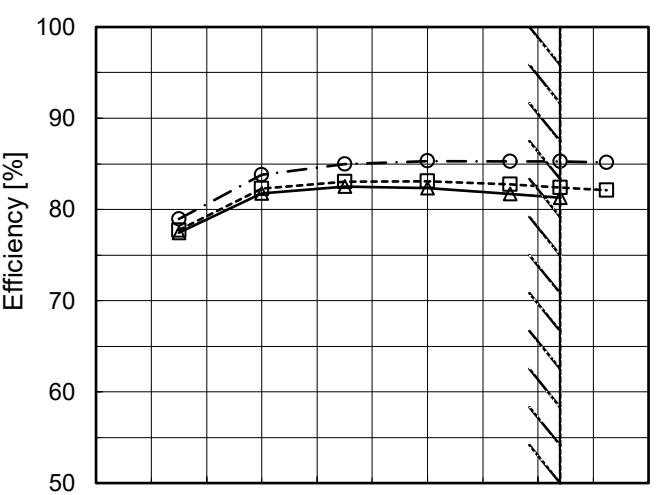
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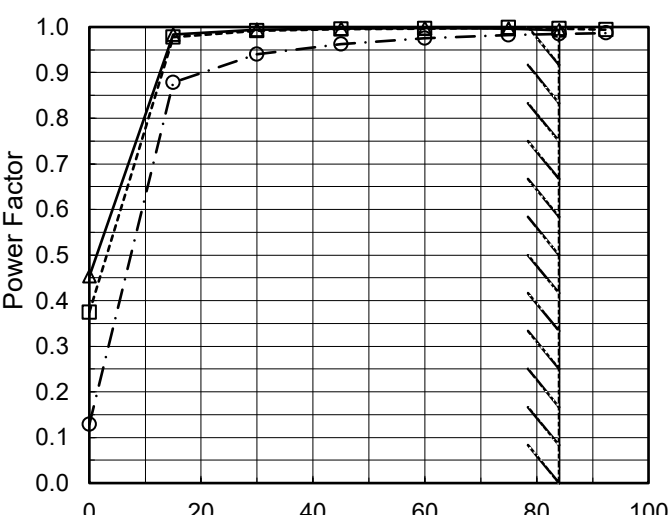
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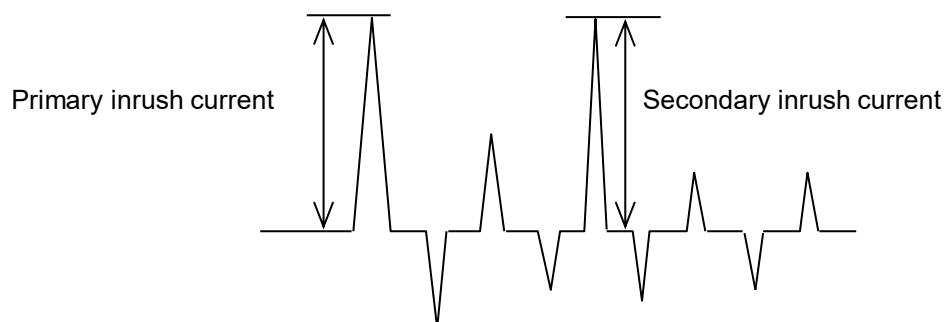
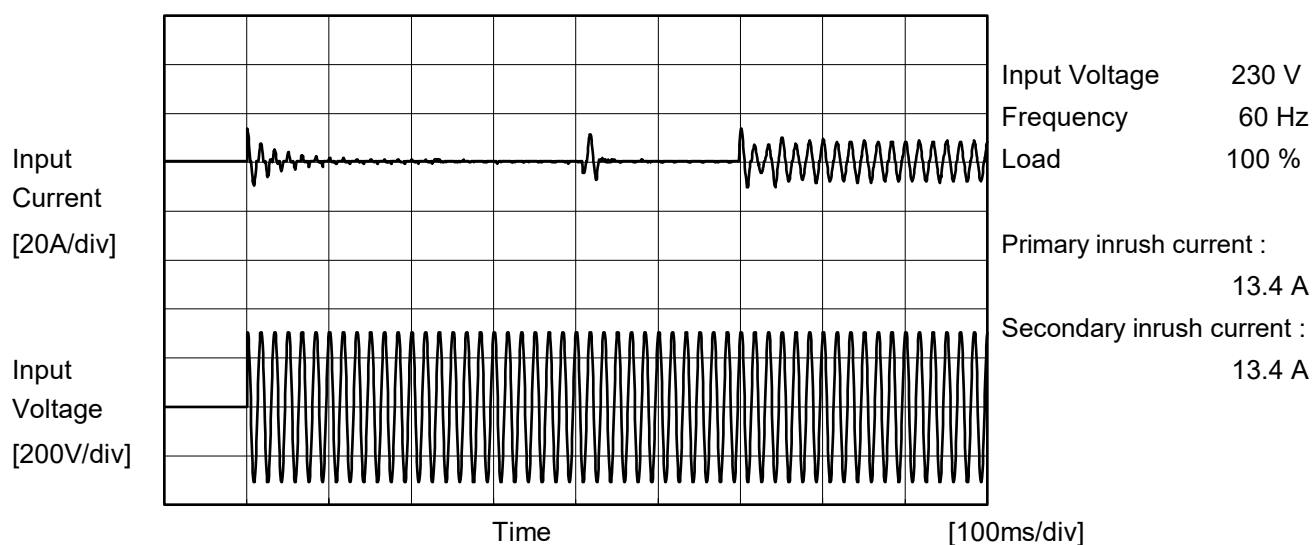
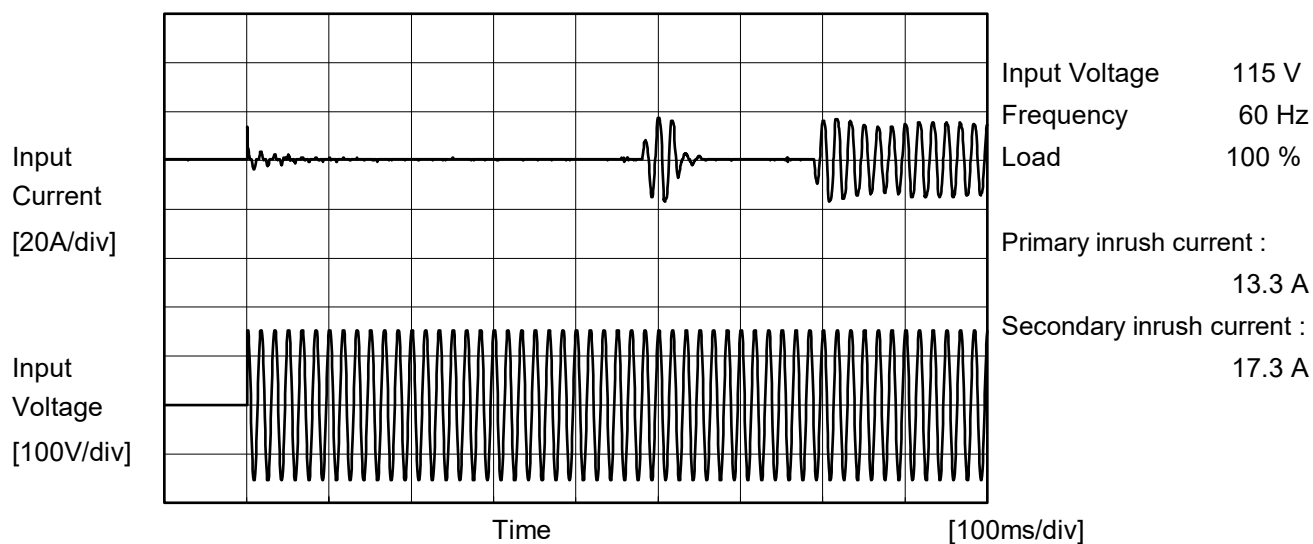
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Model		PJMA1000F-12		Temperature 25°C	
Item		Power Factor (by Load Current)		Testing Circuitry Figure A	
Object					
1.Graph					
		—△— Input Volt. 100V			
		---□--- Input Volt. 115V			
		-·-○-·- Input Volt. 230V			
					
Power Factor					
Load Current [A]					
Note: Slanted line shows the range of the rated load current.					
2.Values					
Load Current [A]		Power Factor			
		Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	
0.0		0.453	0.375	0.129	
15.0		0.983	0.978	0.878	
30.0		0.994	0.992	0.940	
45.0		0.997	0.995	0.963	
60.0		0.998	0.997	0.975	
75.0		0.996	0.998	0.983	
84.0		0.993	0.997	0.985	
92.4		-	0.994	0.987	
--		-	-	-	
--		-	-	-	
--		-	-	-	



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Model	PJMA1000F-12	Temperature    25°C Testing Circuitry   Figure A	
Item	Inrush Current		
Object	_____		





		Temperature 25°C Testing Circuitry Figure B
Model	PJMA1000F-12	
Item	Leakage Current	
Object	_____	

## 1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	115 [V]	240 [V]	
IEC60601-1	Both phases	0.11	0.10	0.25	Operation
	One of phases	0.18	0.22	0.49	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		Testing Circuitry Figure A																																	
Object		+12V84A																																			
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45.0	12.258	12.258	12.258																																																					
60.0	12.258	12.257	12.258																																																					
75.0	12.257	12.256	12.256																																																					
84.0	12.256	12.256	12.256																																																					
92.4	-	12.255	12.255																																																					
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Note: Slanted line shows the range of the rated load current.																																																								

**COSEL**

Model	PJMA1000F-12	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+12V84A	

Input Volt. 115 V  
Cycle 1000 ms

$t_1, t_2 = 50 \mu s$

Load Current

$t_1$

$t_2$

Min.Load (0A) ←→  
Load 100% (84A)

500mV/div

20 ms/div

20 ms/div

Min.Load (0A) ←→  
Load 50% (42A)

500mV/div

20 ms/div

20 ms/div

**COSEL**

Model		PJMA1000F-12	Temperature Testing Circuitry	25°C Figure C																																									
Item		Ripple Voltage (by Load Current)																																											
Object		+12V84A																																											
1.Graph			2.Values																																										
<div><div><div>—△— Input Volt. 115V</div><div>-·-○-- Input Volt. 230V</div></div><div>Y-axis: Ripple Voltage [mV]</div><div>X-axis: Load Current [A]</div></div>			<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 115 [V]</th><th>Input Volt. 230 [V]</th></tr><tr><td>0.0</td><td>10</td><td>40</td></tr><tr><td>21.0</td><td>45</td><td>45</td></tr><tr><td>42.0</td><td>60</td><td>65</td></tr><tr><td>63.0</td><td>50</td><td>60</td></tr><tr><td>84.0</td><td>65</td><td>60</td></tr><tr><td>92.4</td><td>60</td><td>55</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 115 [V]	Input Volt. 230 [V]	0.0	10	40	21.0	45	45	42.0	60	65	63.0	50	60	84.0	65	60	92.4	60	55	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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<div>Measured by 20 MHz Oscilloscope.</div> <div>Ripple Voltage is shown as p-p in the figure below.</div> <div>Note: Slanted line shows the range of the rated load current.</div>																																													
<div><div>T1: Due to AC Input Line</div><div>T2: Due to Switching</div></div>																																													
Fig. Complex Ripple Wave Form																																													

**COSEL**

Model		PJMA1000F-12	Temperature Testing Circuitry	25°C Figure C
Item		Ripple-Noise		
Object		+12V84A		
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> 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LOREL																																									
Model	PJMA1000F-12																																								
Item	Ripple Voltage (by Ambient Temp.)	Testing Circuitry	Figure A																																						
Object	+12V84A																																								
1.Graph		2.Values																																							
<div><div><div>---□--- Input Volt. 115V</div><div>—△— Input Volt. 230V</div></div><p>Ripple Voltage [mV]</p><p>Ambient Temperature [°C]</p><p>Load 100 %</p></div>		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 115 [V]</th><th>Input Volt. 230 [V]</th></tr><tr><td>-30</td><td>135</td><td>145</td></tr><tr><td>-20</td><td>150</td><td>135</td></tr><tr><td>0</td><td>90</td><td>90</td></tr><tr><td>25</td><td>70</td><td>65</td></tr><tr><td>50</td><td>50</td><td>60</td></tr><tr><td>60</td><td>55</td><td>55</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Ripple Voltage [mV]		Input Volt. 115 [V]	Input Volt. 230 [V]	-30	135	145	-20	150	135	0	90	90	25	70	65	50	50	60	60	55	55	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
Ambient Temperature [°C]	Ripple Voltage [mV]																																								
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-30	135	145																																							
-20	150	135																																							
0	90	90																																							
25	70	65																																							
50	50	60																																							
60	55	55																																							
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Note: Slanted line shows the range of the rated ambient temperature.																																									



Model		PJMA1000F-12		Testing Circuitry    Figure A																																																		
Item		Ambient Temperature Drift																																																				
Object		+12V84A																																																				
1.Graph		<div><div><div>—△—</div><div>Input Volt. 100V</div></div><div><div>---□---</div><div>Input Volt. 115V</div></div><div><div>-·-○-·-</div><div>Input Volt. 230V</div></div></div> <div><div>Output Voltage [V]</div><div>Ambient Temperature [°C]</div></div>		2.Values																																																		
		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 115[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>-30</td><td>12.098</td><td>12.098</td><td>12.097</td></tr><tr><td>-20</td><td>12.197</td><td>12.196</td><td>12.196</td></tr><tr><td>-10</td><td>12.210</td><td>12.209</td><td>12.209</td></tr><tr><td>0</td><td>12.223</td><td>12.223</td><td>12.224</td></tr><tr><td>10</td><td>12.236</td><td>12.235</td><td>12.236</td></tr><tr><td>25</td><td>12.249</td><td>12.249</td><td>12.250</td></tr><tr><td>30</td><td>12.256</td><td>12.256</td><td>12.256</td></tr><tr><td>40</td><td>12.263</td><td>12.263</td><td>12.263</td></tr><tr><td>50</td><td>12.269</td><td>12.269</td><td>12.269</td></tr><tr><td>60</td><td>12.270</td><td>12.270</td><td>12.271</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	-30	12.098	12.098	12.097	-20	12.197	12.196	12.196	-10	12.210	12.209	12.209	0	12.223	12.223	12.224	10	12.236	12.235	12.236	25	12.249	12.249	12.250	30	12.256	12.256	12.256	40	12.263	12.263	12.263	50	12.269	12.269	12.269	60	12.270	12.270	12.271	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																					
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]																																																			
-30	12.098	12.098	12.097																																																			
-20	12.197	12.196	12.196																																																			
-10	12.210	12.209	12.209																																																			
0	12.223	12.223	12.224																																																			
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--	-	-	-																																																			
Note: Slanted line shows the range of the rated ambient temperature.		Note: In case of Input Volt. 100V, Load 90%. Other case Load 100%.																																																				



COSEL		Testing Circuitry Figure A
Model	PJMA1000F-12	
Item	Output Voltage Accuracy	
Object	+12V84A	

### 1. Output Voltage Accuracy

This is defined as the value of the output voltage, regulation load, ambient temperature and input voltage varied at random in the range as specified below.

Temperature : -20 - 50°C

Input Voltage : 115 - 264V

Load Current : 0 - 84A

\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

\* Output Voltage Accuracy (Ratio) = 
$$\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$$

### 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	50	115	0	12.276	±40	±0.3
Minimum Voltage	-20	115	84	12.196		

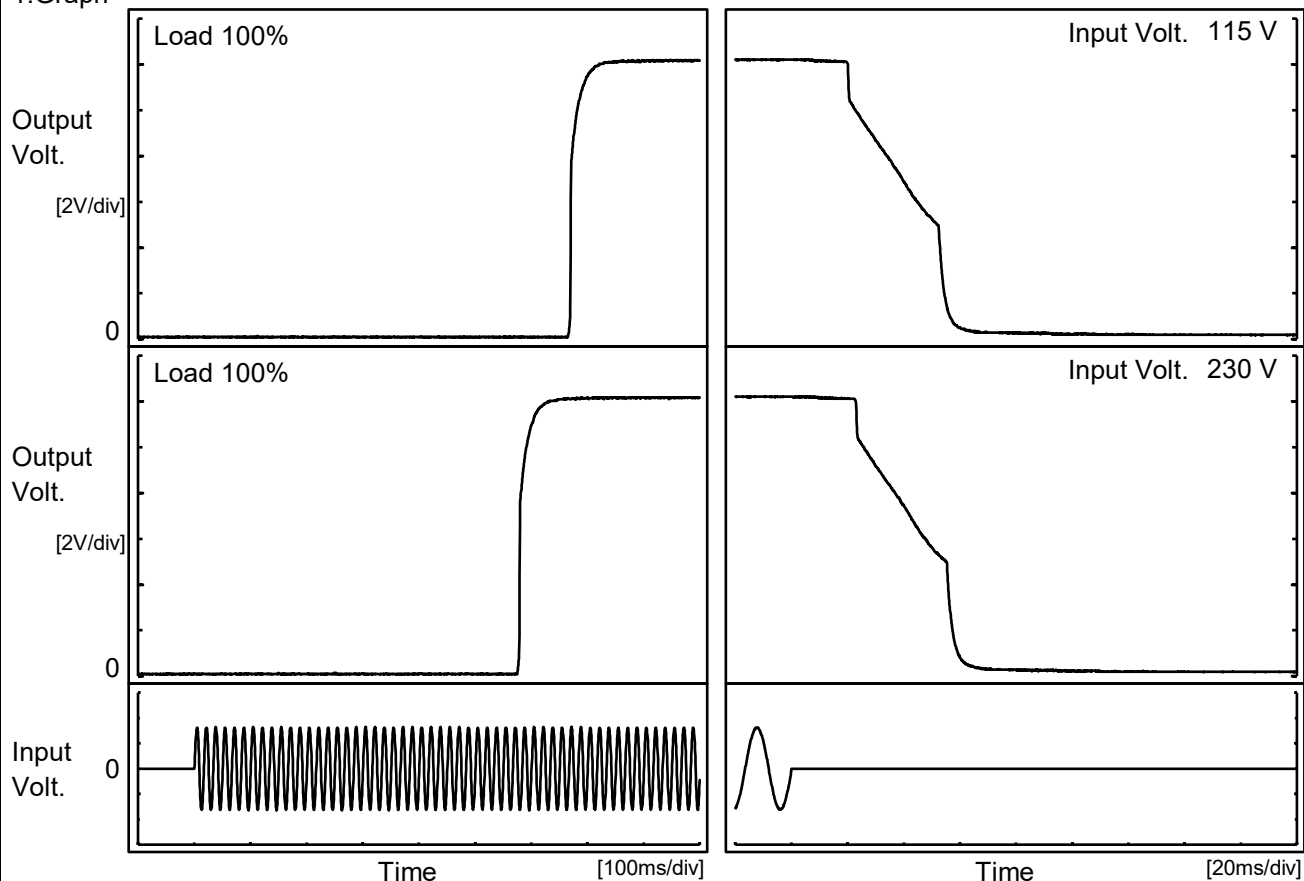
**COSEL**

Model		PJMA1000F-12		Temperature25°C Testing CircuitryFigure A
Item		Time Lapse Drift		
Object		+12V84A		
1.Graph				2.Values
<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**

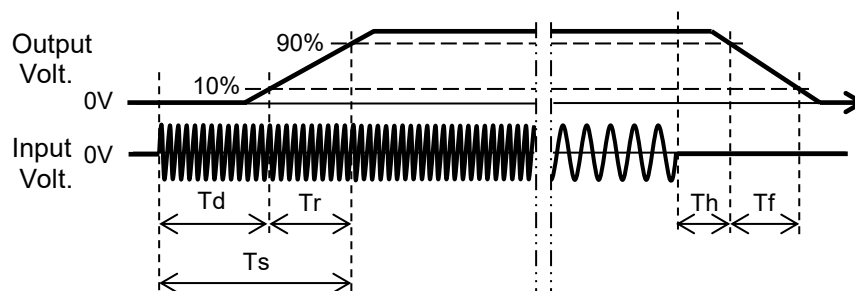
Model	PJMA1000F-12	Temperature 25°C Testing Circuitry Figure A
Item	Rise and Fall Time	
Object	+12V84A	

## 1.Graph



## 2.Values

		[ms]				
Input Volt.	Time	Td	Tr	Ts	Th	Tf
115 V		669.5	20.5	690.0	20.4	35.2
230 V		579.0	20.5	599.5	23.2	35.3



Model		PJMA1000F-12		Temperature		25°C																																	
Item		Hold-Up Time		Testing Circuitry		Figure A																																	
Object		+12V84A																																					
1.Graph				2.Values																																			
<div><div><div>-----□----- Load 50%</div><div>-----△----- Load 100%</div></div><div>Hold-Up Time [ms]</div><div>Input Voltage [V]</div></div> <div><p>This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.</p><p>Note: Slanted line shows the range of the rated input voltage.</p></div>				<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Hold-Up Time [ms]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>85</td><td>43</td><td>25 ※1</td></tr><tr><td>100</td><td>45</td><td>22 ※2</td></tr><tr><td>115</td><td>46</td><td>20</td></tr><tr><td>170</td><td>48</td><td>21</td></tr><tr><td>200</td><td>50</td><td>22</td></tr><tr><td>230</td><td>51</td><td>23</td></tr><tr><td>264</td><td>52</td><td>24</td></tr><tr><td>280</td><td>52</td><td>24</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table> <div>※1:Load 80%</div> <div>※2:Load 90%</div>				Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	85	43	25 ※1	100	45	22 ※2	115	46	20	170	48	21	200	50	22	230	51	23	264	52	24	280	52	24	--	-	-
Input Voltage [V]	Hold-Up Time [ms]																																						
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280	52	24																																					
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# COSEL

Model		PJMA1000F-12		Temperature 25°C																																																				
Item		Instantaneous Interruption Compensation		Testing Circuitry Figure A																																																				
Object		+12V84A																																																						
1.Graph				2.Values																																																				
<div><div><div>—△—</div><div>Input Volt.</div><div>100V</div></div><div><div>---□---</div><div>Input Volt.</div><div>115V</div></div><div><div>-·-○-·-</div><div>Input Volt.</div><div>230V</div></div></div> <p>Instantaneous Compensation Time [ms]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Time [ms]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 115[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>15.0</td><td>18</td><td>26</td><td>147</td></tr><tr><td>30.0</td><td>17</td><td>22</td><td>71</td></tr><tr><td>45.0</td><td>17</td><td>22</td><td>61</td></tr><tr><td>60.0</td><td>17</td><td>22</td><td>45</td></tr><tr><td>75.0</td><td>17</td><td>22</td><td>36</td></tr><tr><td>84.0</td><td>17</td><td>20</td><td>30</td></tr><tr><td>92.4</td><td>-</td><td>17</td><td>29</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. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	0.0	-	-	-	15.0	18	26	147	30.0	17	22	71	45.0	17	22	61	60.0	17	22	45	75.0	17	22	36	84.0	17	20	30	92.4	-	17	29	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																							
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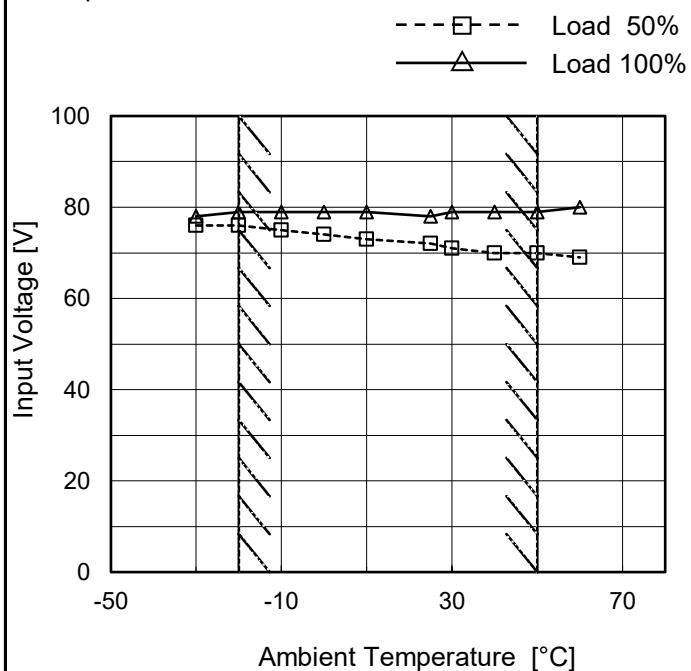
Model PJMA1000F-12

Item Minimum Input Voltage  
for Regulated Output Voltage

Object +12V84A

Testing Circuitry Figure A

### 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%
-30	76	78
-20	76	79
-10	75	79
0	74	79
10	73	79
25	72	78
30	71	79
40	70	79
50	70	79
60	69	80
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BC-11655



Model		PJMA1000F-12	Testing Circuitry    Figure A																																						
Item		Overvoltage Protection																																							
Object		+12V84A																																							
1.Graph			2.Values																																						
<div><div><div><div><div></div><div>△</div></div><div>Input Volt.    115V</div></div><div><div><div></div><div>□</div></div><div>Input Volt.    230V</div></div></div><div><p>Operating Point [V]</p><p>Ambient Temperature [°C]</p><p>Load 0%</p></div><p>Note: Slanted line shows the range of the rated ambient temperature.</p></div>			<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="2">Operating Point [V]</th></tr><tr><th>Input Volt. 115[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>-30</td><td>15.56</td><td>15.44</td></tr><tr><td>-20</td><td>15.61</td><td>15.61</td></tr><tr><td>-10</td><td>15.61</td><td>15.61</td></tr><tr><td>0</td><td>15.73</td><td>15.73</td></tr><tr><td>10</td><td>15.84</td><td>15.84</td></tr><tr><td>25</td><td>16.02</td><td>16.02</td></tr><tr><td>30</td><td>16.02</td><td>16.02</td></tr><tr><td>40</td><td>16.13</td><td>16.13</td></tr><tr><td>50</td><td>16.25</td><td>16.25</td></tr><tr><td>60</td><td>16.31</td><td>16.31</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>	Ambient Temperature [°C]	Operating Point [V]		Input Volt. 115[V]	Input Volt. 230[V]	-30	15.56	15.44	-20	15.61	15.61	-10	15.61	15.61	0	15.73	15.73	10	15.84	15.84	25	16.02	16.02	30	16.02	16.02	40	16.13	16.13	50	16.25	16.25	60	16.31	16.31	--	-	-
Ambient Temperature [°C]	Operating Point [V]																																								
	Input Volt. 115[V]	Input Volt. 230[V]																																							
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40	16.13	16.13																																							
50	16.25	16.25																																							
60	16.31	16.31																																							
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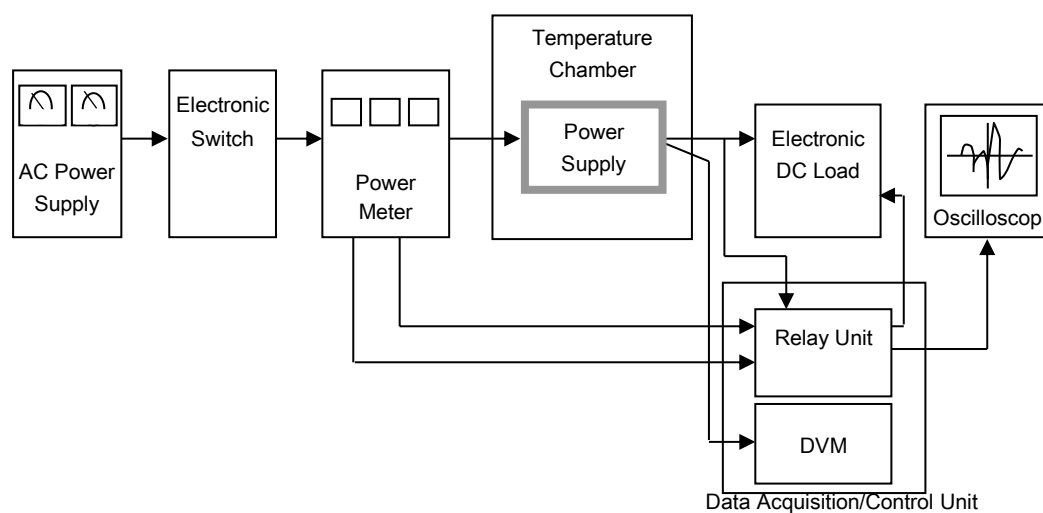


Figure A

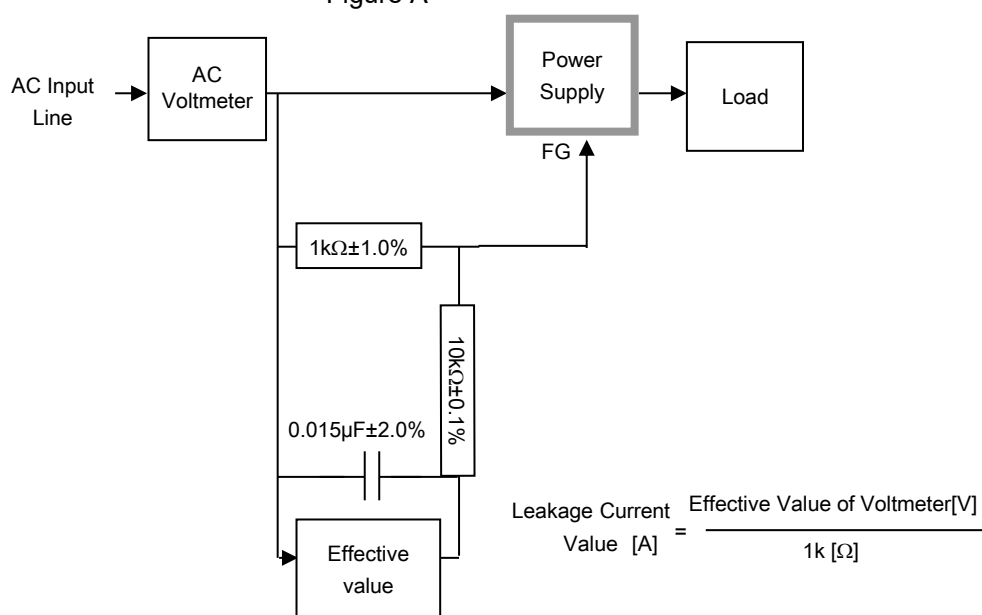


Figure B (IEC60601-1)

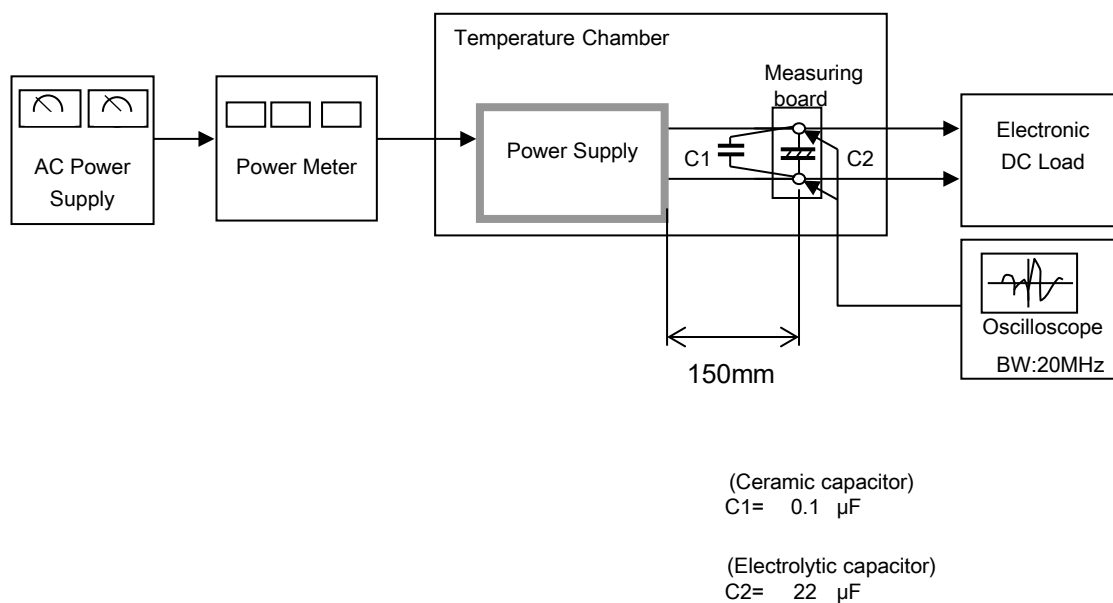


Figure C