

TEST DATA OF KHEA240F-24

Regulated DC Power Supply
July 6, 2012

Approved by : Yukihiro Takehashi
Yukihiro Takehashi Design Manager

Prepared by : Seiya Shimada
Seiya Shimada Design Engineer

COSEL CO.,LTD.

CONTENTS

1.Input Current (by Load Current)	1
2.Input Power (by Load Current)	2
3.Efficiency (by Input Voltage)	3
4.Efficiency (by Load Current)	4
5.Power Factor (by Input Voltage)	5
6.Power Factor (by Load Current)	6
7.Inrush Current	7
8.Leakage Current	8
9.Line Regulation	9
10.Load Regulation	10
11.Dynamic Load Response	11
12.Ripple Voltage (by Load Current)	12
13.Ripple-Noise	13
14.Ripple Voltage (by Ambient Temperature)	14
15.Ambient Temperature Drift	15
16.Output Voltage Accuracy	16
17.Time Lapse Drift	17
18.Rise and Fall Time	18
19.Hold-Up Time	19
20.Instantaneous Interruption Compensation	20
21.Minimum Input Voltage for Regulated Output Voltage	21
22.Overcurrent Protection	22
23.Overvoltage Protection	23
24.Figure of Testing Circuitry	24

(Final Page 25)

COSEL

Model		KHEA240F-24	
Item		Input Current (by Load Current)	
Object			

1.Graph

—△—

Input Volt. 100V

100V

---□---

Input Volt. 115V

115V

---○---

Input Volt. 230V

230V

5.0

4.0

3.0

2.0

1.0

0.0

0

4

8

12

16

Input Current [A]

Load Current [A]

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

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.0	0.085	0.081	0.088
2.0	0.584	0.513	0.314
4.0	1.086	0.947	0.520
6.0	1.594	1.385	0.729
8.0	2.108	1.830	0.942
10.0	2.628	2.276	1.157
11.0	2.892	2.503	1.265
13.0	3.422	2.960	1.483
15.0	3.960	3.421	1.706
--	-	-	-
--	-	-	-

BC-10674

COSEL

Model KHEA240F-24

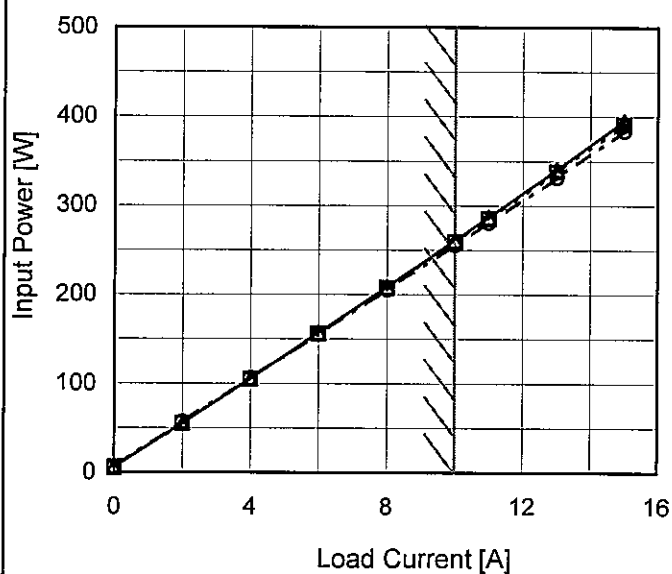
Item Input Power (by Load Current)

Object

Temperature 25°C
Testing Circuitry Figure A

1. Graph

—△— Input Volt. 100V
 ---□--- Input Volt. 115V
 -·-○-·- Input Volt. 230V



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

2. Values

Load Current [A]	Input Power [W]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.0	5.6	5.6	5.6
2.0	54.9	54.8	56.9
4.0	105.4	105.1	105.8
6.0	156.9	155.8	155.3
8.0	208.5	207.6	205.4
10.0	260.7	259.2	255.6
11.0	287.1	285.3	280.8
13.0	340.5	338.1	331.7
15.0	395.0	391.2	384.0
--	-	-	-
--	-	-	-

COSEL

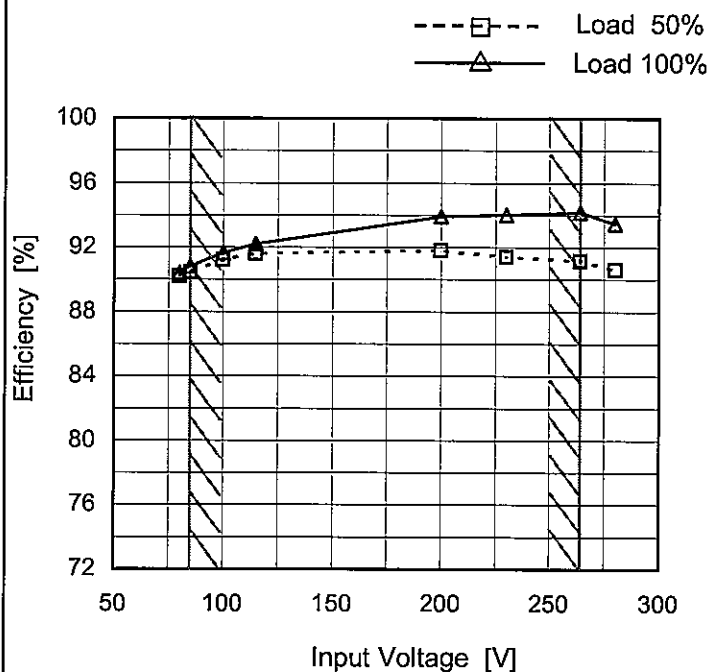
Model KHEA240F-24

Item Efficiency (by Input Voltage)

Object

Temperature 25°C
Testing Circuitry Figure A

1. Graph



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

2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
80	90.2	90.4
85	90.4	90.8
100	91.2	91.7
115	91.6	92.2
200	91.8	93.9
230	91.4	94.0
264	91.2	94.2
280	90.6	93.5
--	-	-

COSEL

Model

KHEA240F-24

Item

Efficiency (by Load Current)

Object

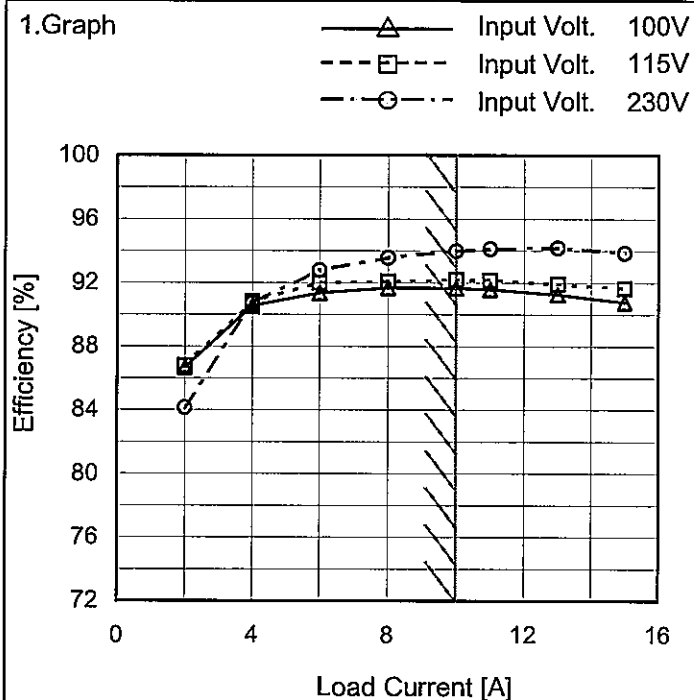
Temperature

25°C

Testing Circuitry

Figure A

1.Graph



2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.0	-	-	-
2.0	86.7	86.8	84.1
4.0	90.5	90.8	90.7
6.0	91.3	92.0	92.8
8.0	91.7	92.1	93.6
10.0	91.7	92.2	94.0
11.0	91.6	92.2	94.1
13.0	91.3	91.9	94.2
15.0	90.8	91.7	93.9
--	-	-	-
--	-	-	-

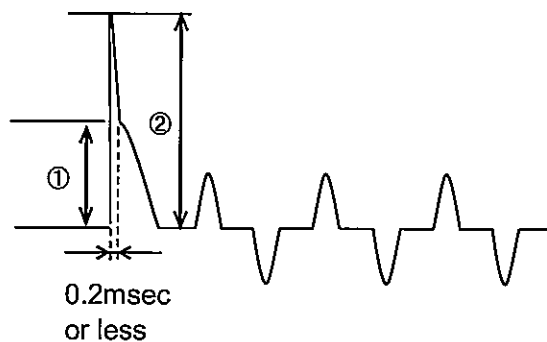
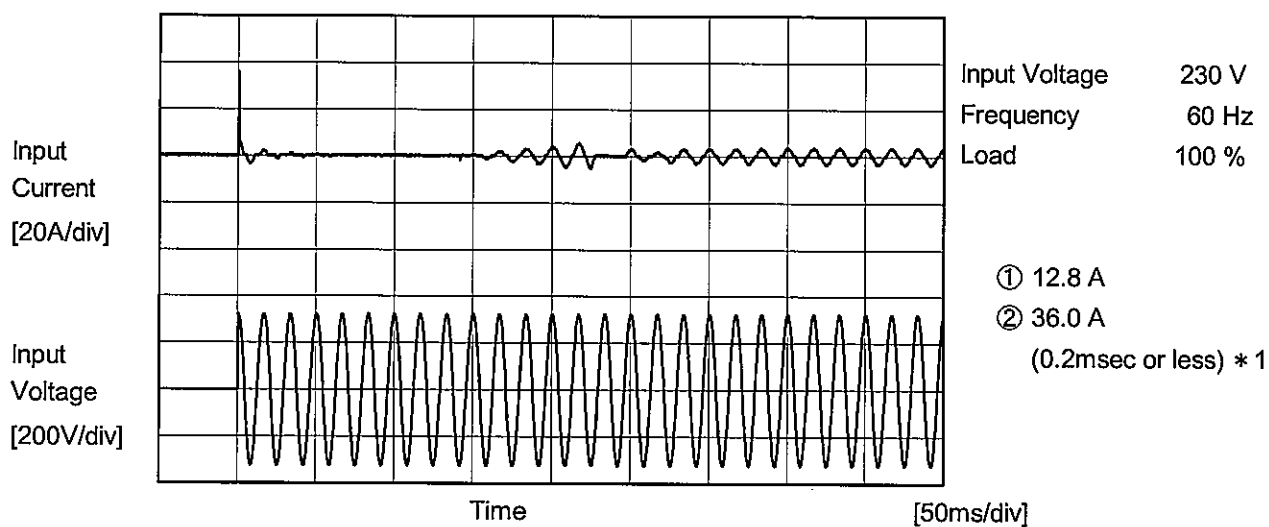
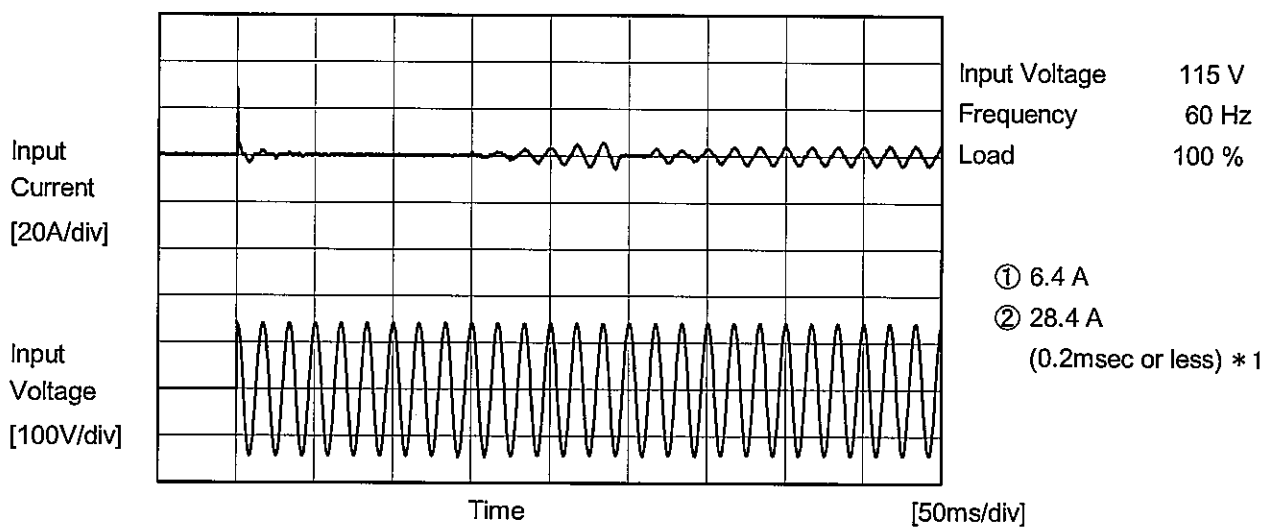
Model		KHEA240F-24	
Item		Power Factor (by Input Voltage)	
Object			
1.Graph		2.Values	

<

Model		KHEA240F-24		Temperature 25°C																																																				
Item		Power Factor (by Load Current)		Testing Circuitry Figure A																																																				
Object																																																								
1.Graph		<div><div>—△—</div>Input Volt. 100V</div> <div><div>---□---</div>Input Volt. 115V</div> <div><div>-○-</div>Input Volt. 230V</div> <div>Power Factor</div> <div>Load Current [A]</div>		2.Values																																																				
				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Power Factor</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>0.657</td><td>0.599</td><td>0.277</td></tr><tr><td>2.0</td><td>0.940</td><td>0.929</td><td>0.788</td></tr><tr><td>4.0</td><td>0.971</td><td>0.964</td><td>0.885</td></tr><tr><td>6.0</td><td>0.985</td><td>0.979</td><td>0.926</td></tr><tr><td>8.0</td><td>0.990</td><td>0.988</td><td>0.948</td></tr><tr><td>10.0</td><td>0.994</td><td>0.992</td><td>0.961</td></tr><tr><td>11.0</td><td>0.995</td><td>0.993</td><td>0.965</td></tr><tr><td>13.0</td><td>0.997</td><td>0.995</td><td>0.972</td></tr><tr><td>15.0</td><td>0.997</td><td>0.996</td><td>0.980</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]	Power Factor			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	0.0	0.657	0.599	0.277	2.0	0.940	0.929	0.788	4.0	0.971	0.964	0.885	6.0	0.985	0.979	0.926	8.0	0.990	0.988	0.948	10.0	0.994	0.992	0.961	11.0	0.995	0.993	0.965	13.0	0.997	0.995	0.972	15.0	0.997	0.996	0.980	--	-	-	-	--	-	-	-
Load Current [A]	Power Factor																																																							
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]																																																					
0.0	0.657	0.599	0.277																																																					
2.0	0.940	0.929	0.788																																																					
4.0	0.971	0.964	0.885																																																					
6.0	0.985	0.979	0.926																																																					
8.0	0.990	0.988	0.948																																																					
10.0	0.994	0.992	0.961																																																					
11.0	0.995	0.993	0.965																																																					
13.0	0.997	0.995	0.972																																																					
15.0	0.997	0.996	0.980																																																					
--	-	-	-																																																					
--	-	-	-																																																					
Note: Slanted line shows the range of the rated load current.																																																								

COSEL

Model	KHEA240F-24	Temperature	25°C
Item	Inrush Current	Testing Circuitry	Figure A
Object	_____		



*1 The specification of the inrush current (primary surge) means that the surge current to a built-in noise filter (0.2msec or less : waveform ②) is excluded.

		Temperature 25°C Testing Circuitry Figure B
Model	KHEA240F-24	
Item	Leakage Current	
Object		

1.Results

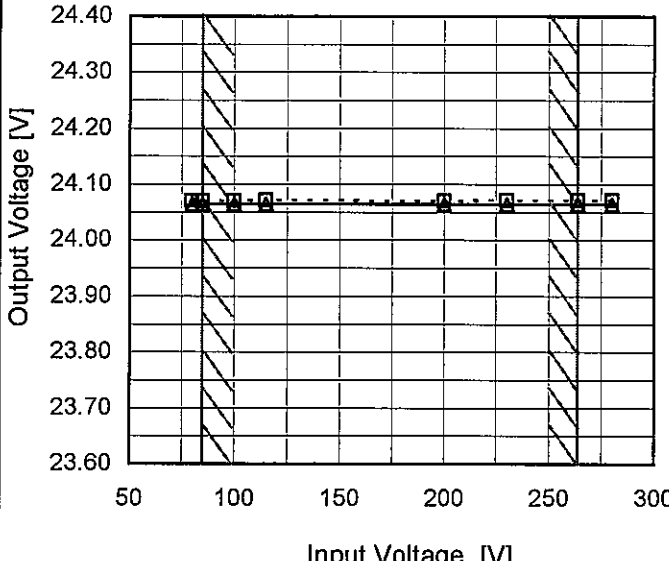
[mA]

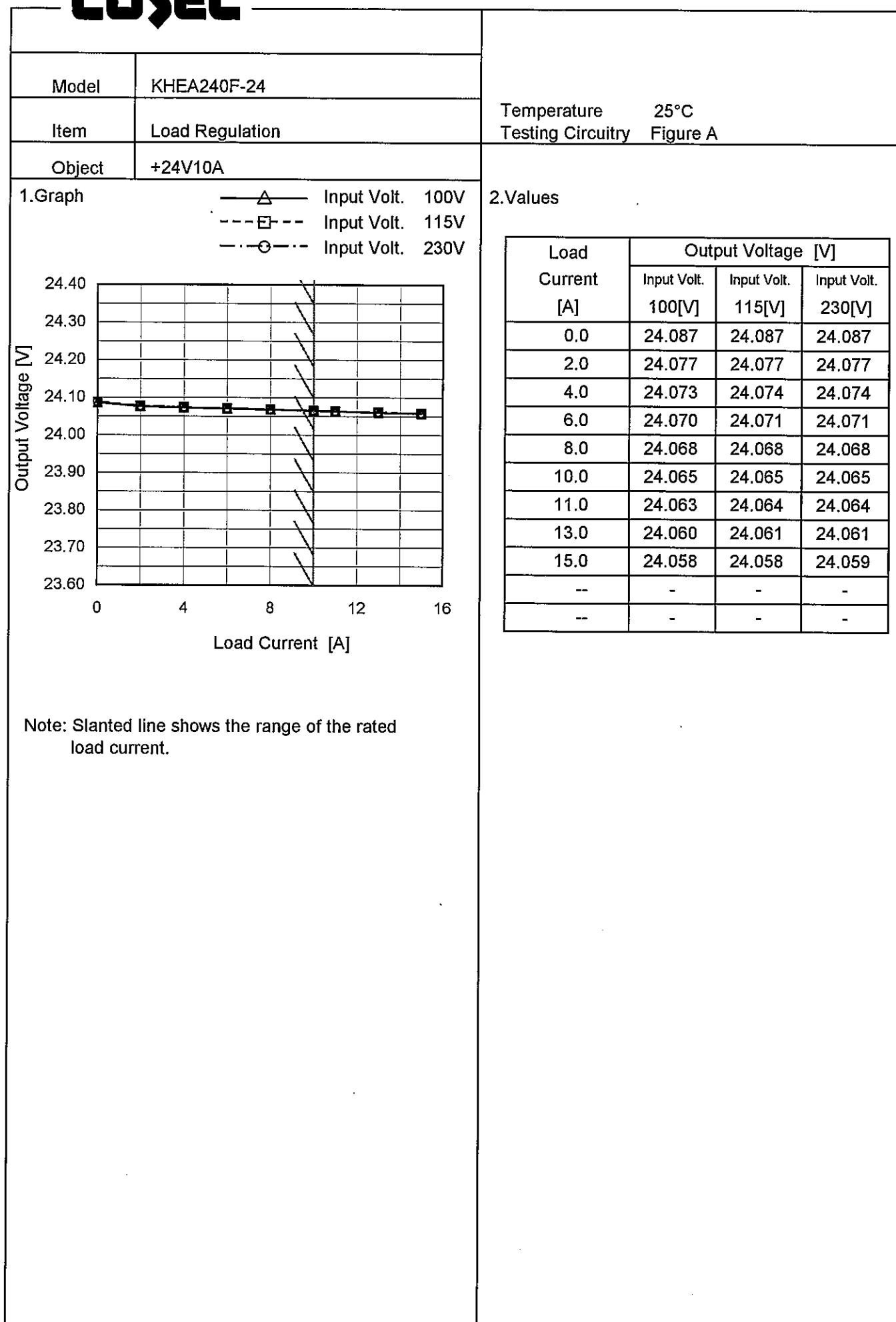
Standards		Input Volt.			Note
		100 [V]	115 [V]	240 [V]	
DEN-AN	Both phases	0.15	0.18	0.39	Operation
	One of phases	0.31	0.36	0.76	Stand by
IEC60950-1	Both phases	0.16	0.18	0.40	Operation
	One of phases	0.30	0.34	0.77	Stand by

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	KHEA240F-24																																		
Item	Line Regulation	Temperature	25°C																																
Object	+24V10A	Testing Circuitry	Figure A																																
1.Graph		2.Values																																	
<div><div>---□--- Load 50%</div><div>—△— Load 100%</div></div>  <p>Output Voltage [V]</p> <p>Input Voltage [V]</p> <p>Note: Slanted line shows the range of the rated input voltage.</p>		<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Output Voltage [V]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>80</td><td>24.071</td><td>24.064</td></tr><tr><td>85</td><td>24.071</td><td>24.065</td></tr><tr><td>100</td><td>24.071</td><td>24.065</td></tr><tr><td>115</td><td>24.071</td><td>24.065</td></tr><tr><td>200</td><td>24.071</td><td>24.065</td></tr><tr><td>230</td><td>24.071</td><td>24.065</td></tr><tr><td>264</td><td>24.071</td><td>24.065</td></tr><tr><td>280</td><td>24.071</td><td>24.065</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	80	24.071	24.064	85	24.071	24.065	100	24.071	24.065	115	24.071	24.065	200	24.071	24.065	230	24.071	24.065	264	24.071	24.065	280	24.071	24.065	--	-	-
Input Voltage [V]	Output Voltage [V]																																		
	Load 50%	Load 100%																																	
80	24.071	24.064																																	
85	24.071	24.065																																	
100	24.071	24.065																																	
115	24.071	24.065																																	
200	24.071	24.065																																	
230	24.071	24.065																																	
264	24.071	24.065																																	
280	24.071	24.065																																	
--	-	-																																	

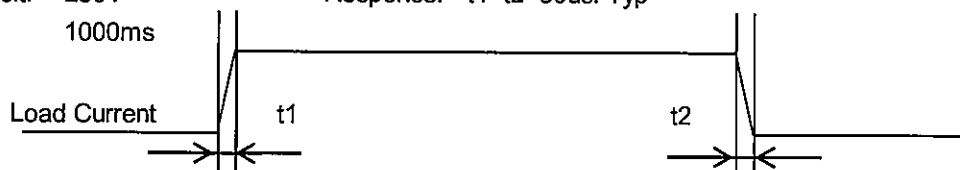


COSEL

Model	KHEA240F-24	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Response	
Object	+24V10A	

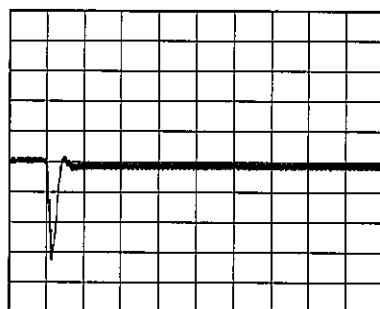
Input Volt. 230V
Cycle 1000ms

Response. $t_1=t_2=50\mu\text{s}$. Typ

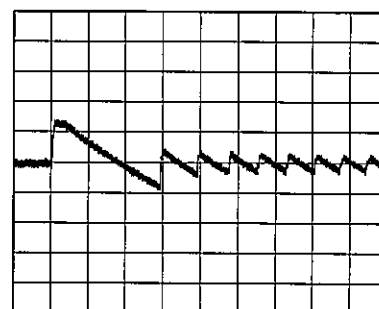


Min. Load (0A) ←→
Load 100% (10.0A)

200 mV/div



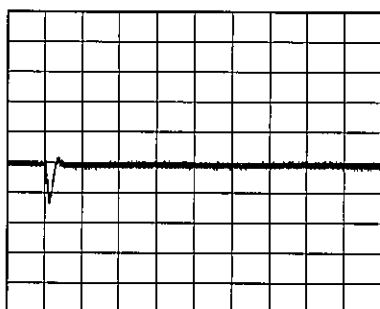
2 ms/div



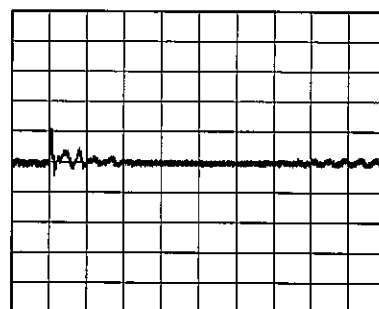
20 ms/div

Load 20% (2.0A) ←→
Load 100% (10.0A)

200 mV/div



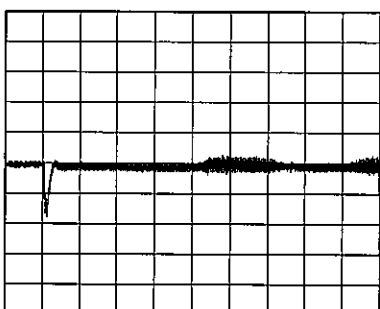
2 ms/div



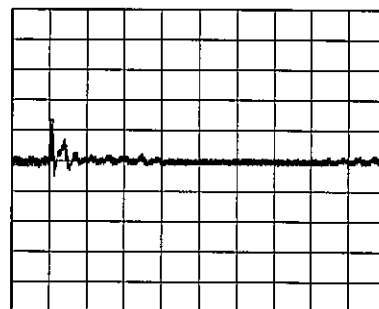
20 ms/div

Load 20% (2.0A) ←→
Load 150% (15.0A)

200 mV/div



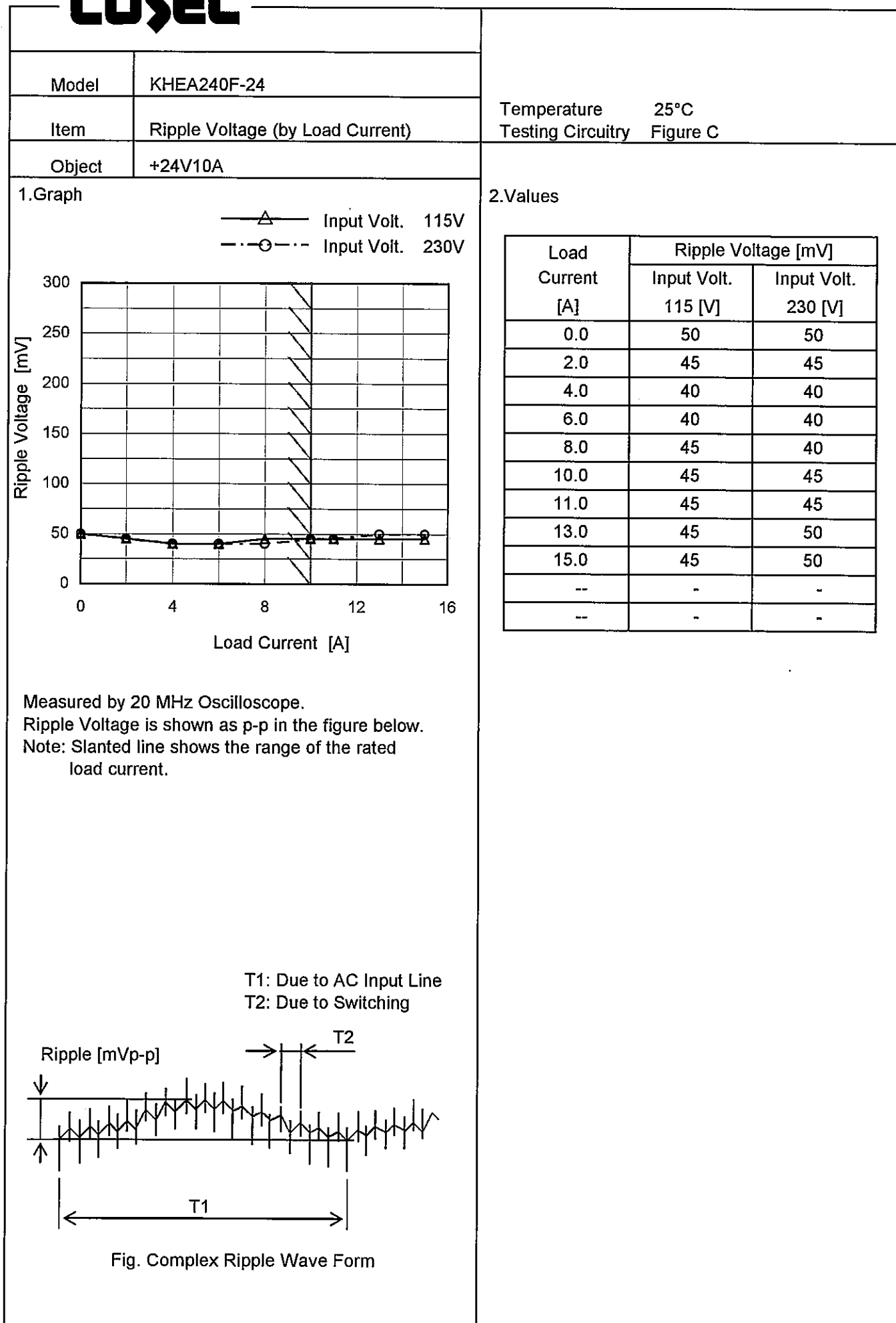
2 ms/div



20 ms/div

* The characteristic of AC115V is equal.

COSEL



COSEL

Model		KHEA240F-24	
Item		Ripple-Noise	
Object		+24V10A	

1.Graph

△

Input Volt. 115V

○

Input Volt. 230V

300

250

200

150

100

50

0

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

8

12

16

0

4

<

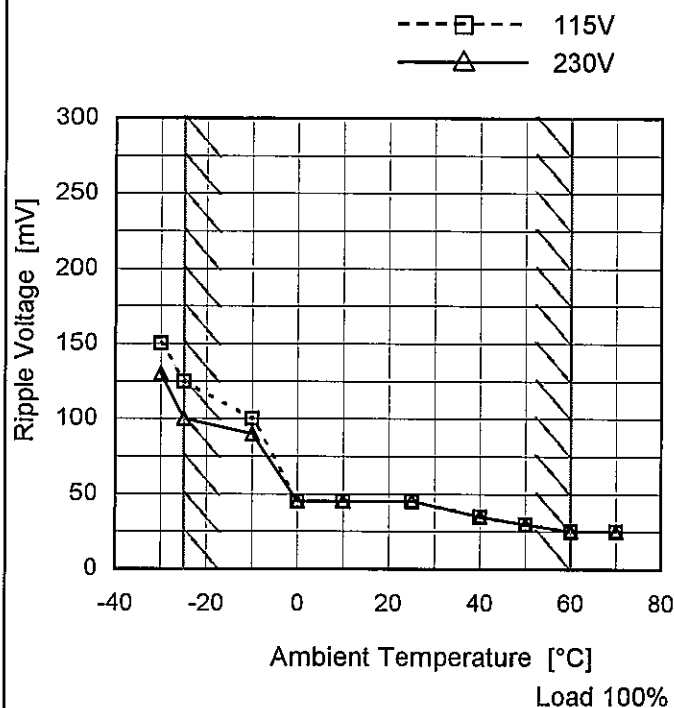
Model KHEA240F-24

Item Ripple Voltage (by Ambient Temp.)

Object +24V10A

Testing Circuitry Figure C

1. Graph



Measured by 20 MHz Oscilloscope.

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

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	115V	230V
-30	150	130
-25	125	100
-10	100	90
0	45	45
10	45	45
25	45	45
40	35	35
50	30	30
60	25	25
70	25	25
--	-	-

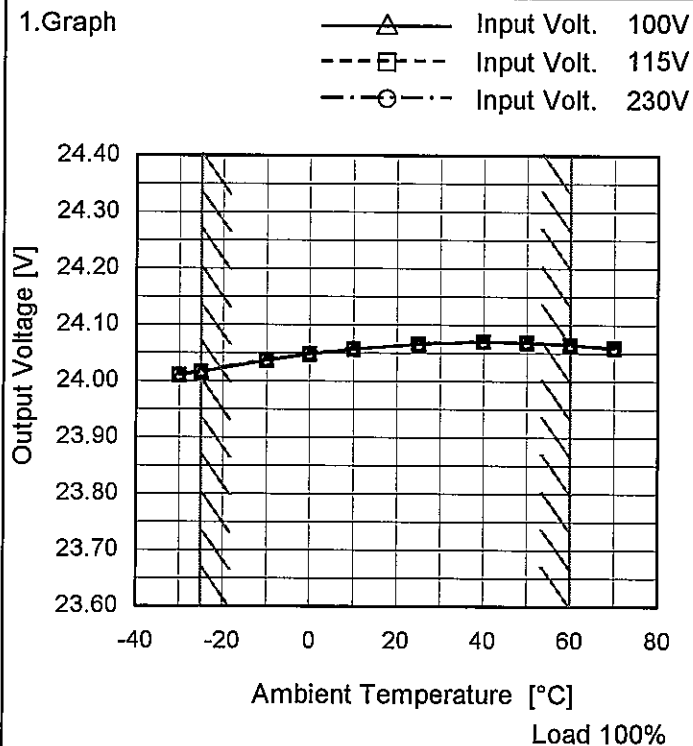
Model KHEA240F-24

Item Ambient Temperature Drift

Object +24V10A

Testing Circuitry Figure A

1. Graph



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

2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
-30	24.010	24.010	24.011
-25	24.016	24.016	24.017
-10	24.037	24.037	24.038
0	24.048	24.048	24.049
10	24.057	24.057	24.058
25	24.065	24.065	24.065
40	24.070	24.070	24.071
50	24.069	24.069	24.069
60	24.065	24.065	24.065
70	24.060	24.059	24.060
--	-	-	-

		Testing Circuitry Figure A
Model	KHEA240F-24	
Item	Output Voltage Accuracy	
Object	+24V10A	

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 : -25 - 60°C

Input Voltage : 85 - 264V

Load Current : 0 - 10A

* 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	264	0	24.097	±41	±0.2
Minimum Voltage	-25	85	10	24.016		

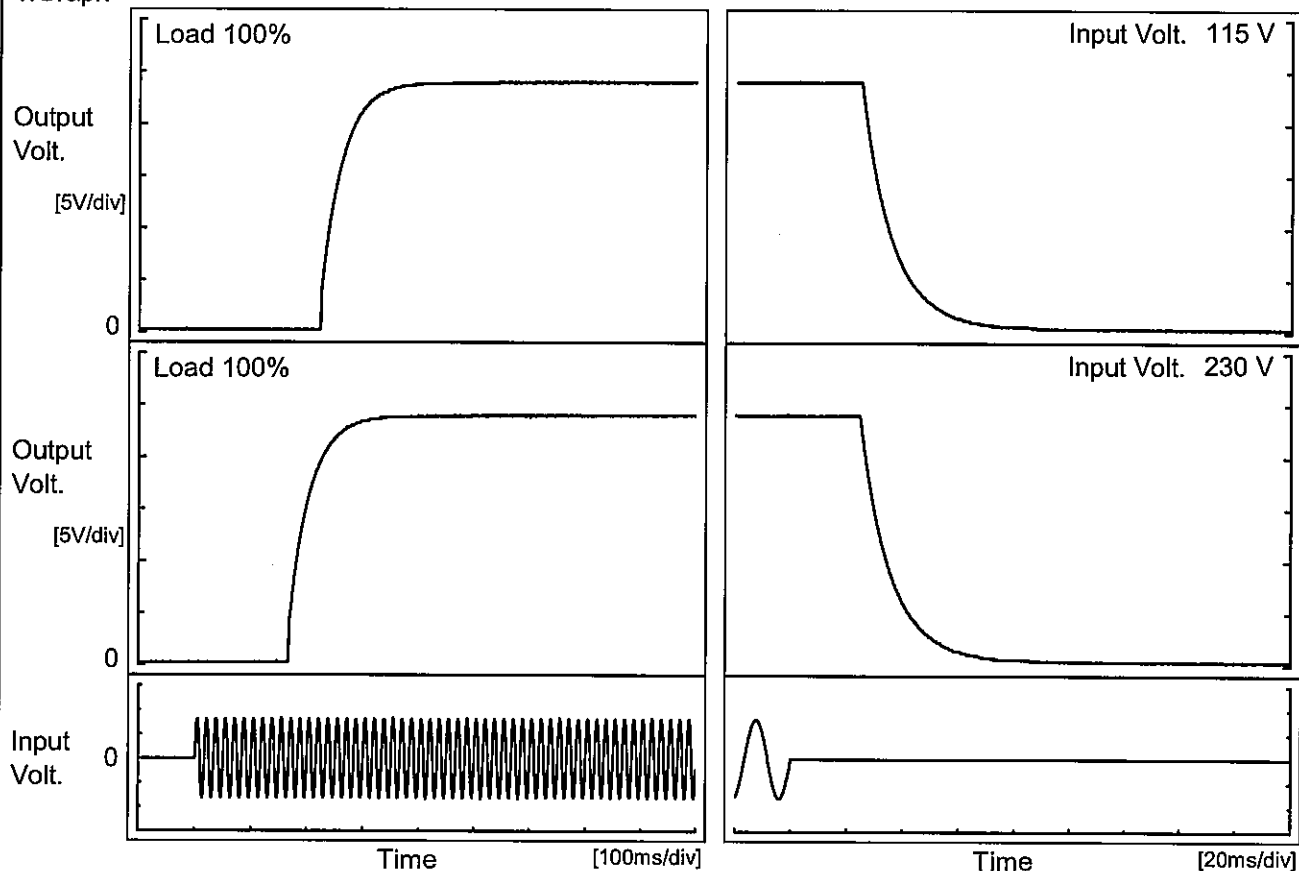
COSEL

Model		KHEA240F-24	Temperature		25°C
Item		Time Lapse Drift	Testing Circuitry		Figure A
Object		+24V10A			
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></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><</div></div></div></div>					

COSEL

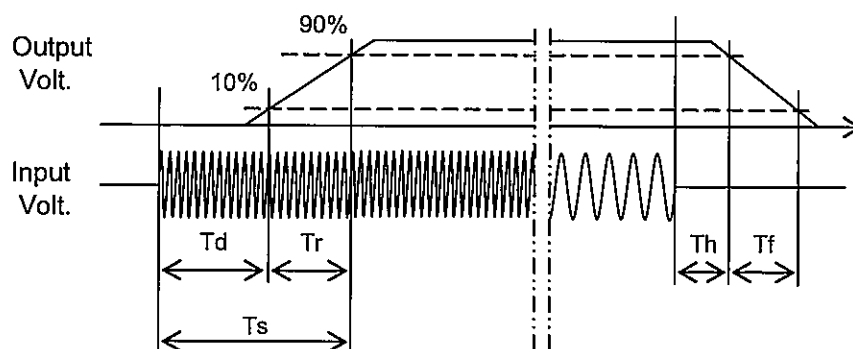
Model	KHEA240F-24	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+24V10A		

1. Graph



2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf
115 V		224.0	82.5	306.5	26.0	24.8
230 V		167.0	82.0	249.0	25.7	25.1



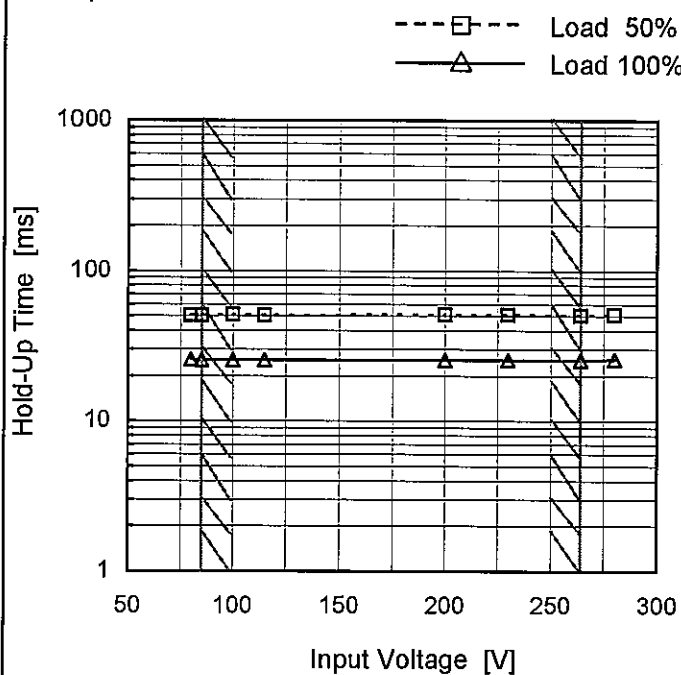
Model KHEA240F-24

Item Hold-Up Time

Object +24V10A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



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

2. Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
80	51	26
85	51	26
100	51	26
115	51	26
200	51	26
230	51	26
264	51	26
280	51	26
--	-	-

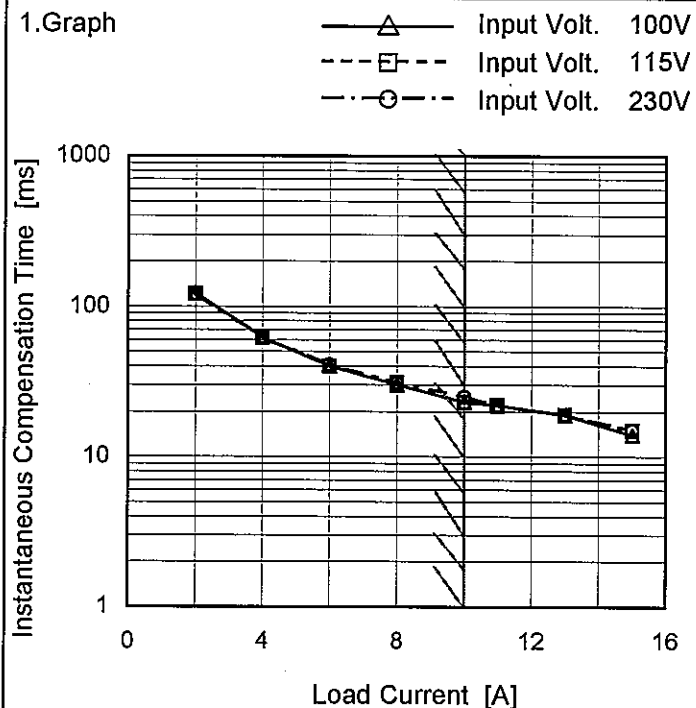
Model KHEA240F-24

Item Instantaneous Interruption Compensation

Object +24V10A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



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

2. Values

Load Current [A]	Time [ms]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.0	-	-	-
2.0	122	121	121
4.0	62	62	62
6.0	40	40	41
8.0	30	31	31
10.0	23	23	25
11.0	22	22	22
13.0	19	19	19
15.0	14	15	15
--	-	-	-
--	-	-	-

Model

KHEA240F-24

Item

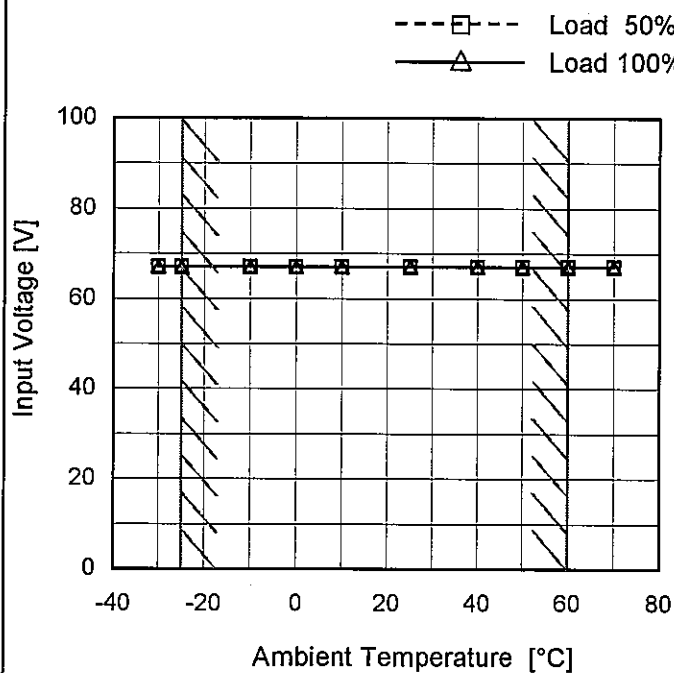
Minimum Input Voltage
for Regulated Output Voltage

Object

+24V10A

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	67	67
-25	67	67
-10	67	67
0	67	67
10	67	67
25	67	67
40	67	67
50	67	67
60	67	67
70	67	67
--	-	-

COSEL

Model		KHEA240F-24	
Item		Overcurrent Protection	
Object		+24V10A	

1.Graph

Input Volt. 115V

Input Volt. 230V

Output Voltage [V]

30

20

10

0

0

5

10

15

20

25

<

Model		KHEA240F-24
Item		Overvoltage Protection
Object		+24V10A

1.Graph

△

Input Volt. 115V

□

Input Volt. 230V

Operating Point [V]

Ambient Temperature [°C]

Load 0%

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

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 115[V]	Input Volt. 230[V]
-30	33.41	33.41
-25	33.41	33.41
-10	33.41	33.41
0	33.41	33.41
10	33.41	33.41
25	33.40	33.40
40	33.40	33.40
50	33.41	33.40
60	33.40	33.40
70	33.40	33.40
--	-	-

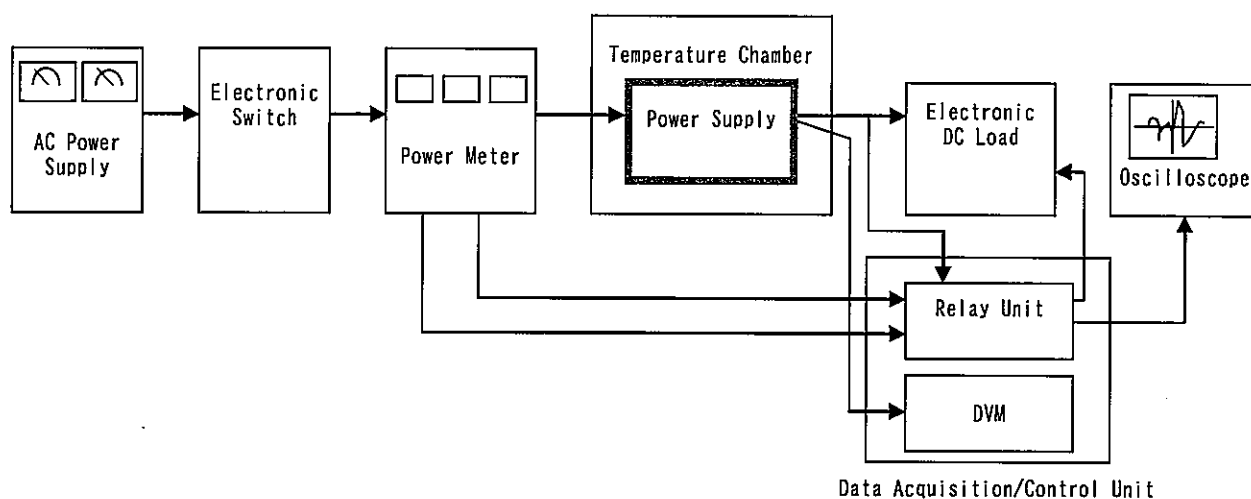


Figure A

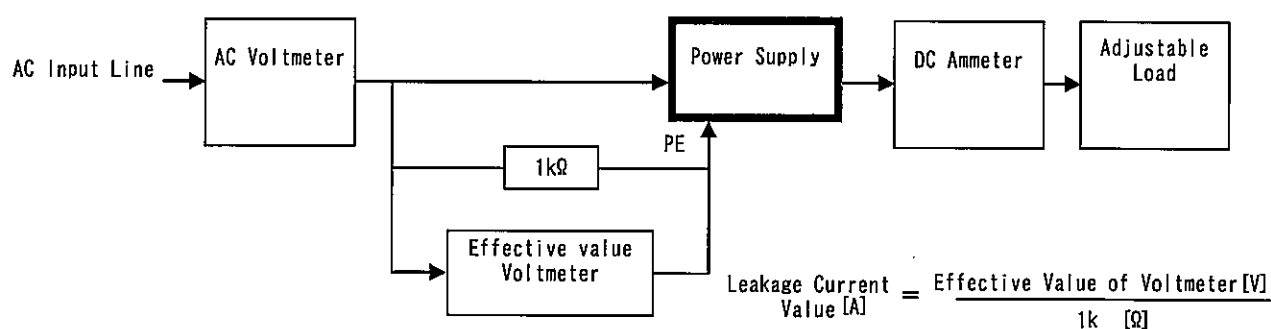


Figure B (DEN-AN)

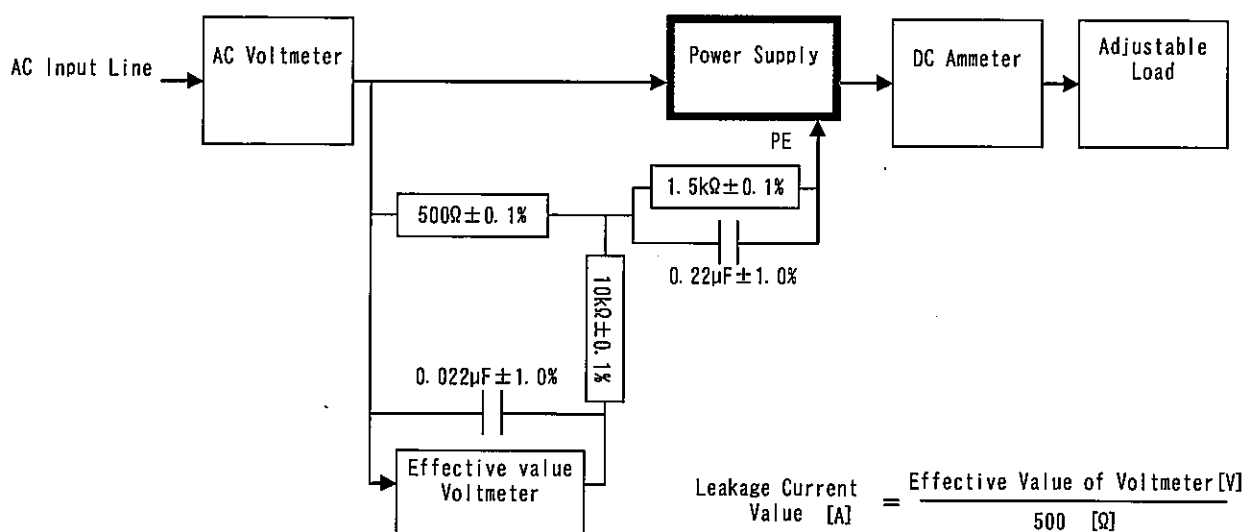
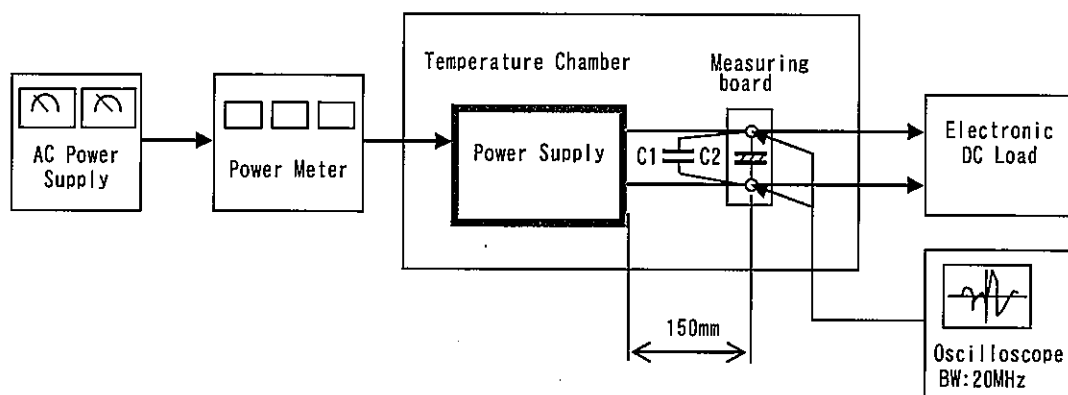


Figure B (IEC60950-1)



C1= 0.1 μ F
(Ceramic capacitor)

C2= 22 μ F
(Electrolytic capacitor)

Figure C