

# TEST DATA OF KHNA90F-24

Regulated DC Power Supply  
November 15, 2013

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**COSEL CO.,LTD.**

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(Final Page 25)

Model

KHNA90F-24

Item

Input Current (by Load Current)

Object

1.Graph

—△—

Input Volt. 100V

---□---

Input Volt. 115V

-·-○-·-

Input Volt. 230V

Input Current [A]

2.00

1.50

1.00

0.50

0.00

0.0

1.0

2.0

3.0

4.0

5.0

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]
0.00	0.048	0.052	0.087
0.15	0.083	0.080	0.107
0.30	0.123	0.114	0.139
0.60	0.205	0.185	0.175
0.90	0.282	0.251	0.196
1.20	0.359	0.317	0.211
1.80	0.516	0.452	0.270
2.40	0.673	0.587	0.336
3.00	0.833	0.724	0.403
3.80	1.054	0.913	0.495
4.18	1.160	1.004	0.540

BC - 10777

Model

KHNA90F-24

Item

Input Power (by Load Current)

Object

1.Graph

—△—

Input Volt. 100V

---□---

Input Volt. 115V

---○---

Input Volt. 230V

Input Power [W]

200

150

100

50

0

0.0

1.0

2.0

3.0

4.0

5.0

Load Current [A]

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]
0.00	1.3	1.3	1.5
0.15	5.7	5.8	6.2
0.30	10.0	10.1	10.7
0.60	18.5	18.6	19.2
0.90	26.4	26.4	27.1
1.20	34.2	34.1	34.7
1.80	50.2	49.9	50.0
2.40	66.0	65.6	65.2
3.00	82.2	81.6	80.6
3.80	104.3	103.4	101.6
4.18	115.0	114.0	111.7

Temperature

25°C

Testing Circuitry

Figure A

BC - 10777

# COSEL

Model		KHNA90F-24	
Item		Efficiency (by Input Voltage)	
Object			

1.Graph

---

□

---

Load 50%

---

△

---

Load 100%

Efficiency [%]

100

90

80

70

60

50

50

100

150

200

250

300

Input Voltage [V]

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

2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
80	86.3	86.6
85	86.7	87.2
90	87.0	88.0
100	87.4	89.1
115	87.7	89.8
200	88.0	90.9
230	87.5	91.0
264	87.4	91.0
280	88.9	90.9

# COSEL

Model		KHNA90F-24	
Item		Efficiency (by Load Current)	
Object			

1.Graph

—△—

Input Volt.

100V

---□---

Input Volt.

115V

---○---

Input Volt.

230V

Efficiency [%]



# COSEL

Model

KHNA90F-24

Item

Power Factor (by Load Current)

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.

Temperature

25°C

Testing Circuitry

Figure A

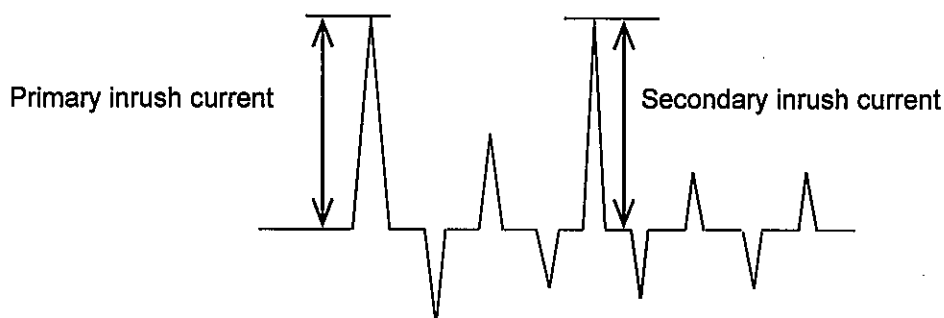
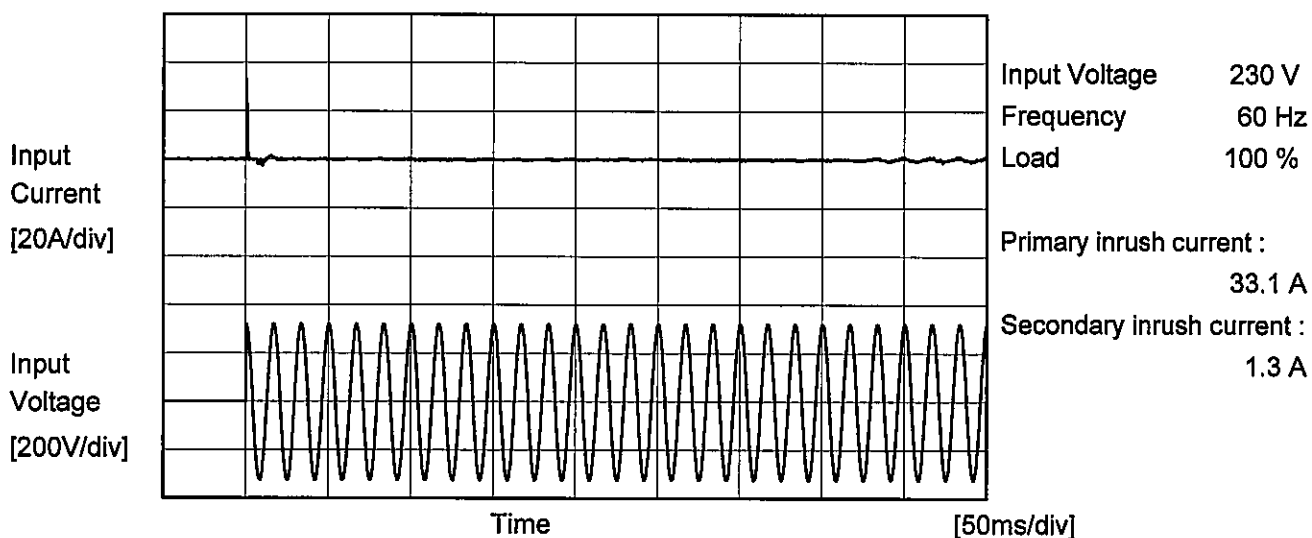
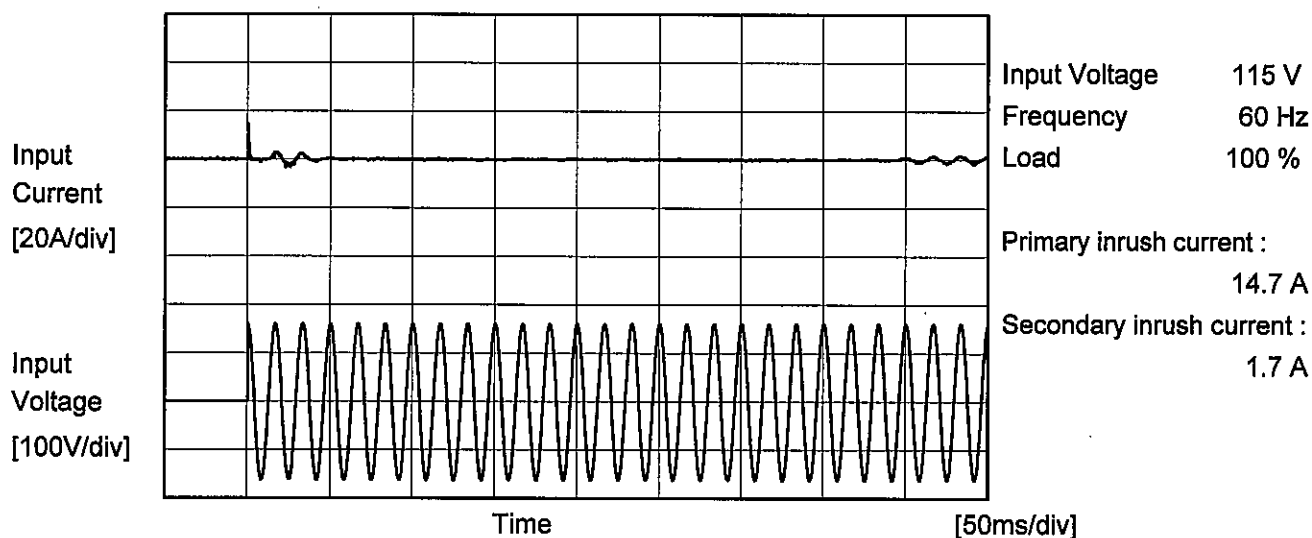
2.Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.00	0.265	0.217	0.076
0.15	0.686	0.622	0.254
0.30	0.813	0.768	0.335
0.60	0.901	0.874	0.477
0.90	0.934	0.914	0.602
1.20	0.952	0.936	0.714
1.80	0.972	0.960	0.804
2.40	0.981	0.972	0.845
3.00	0.987	0.980	0.869
3.80	0.990	0.985	0.892
4.18	0.991	0.987	0.899



# COSEL

Model	KHNA90F-24	Temperature 25°C Testing Circuitry Figure A
Item	Inrush Current	
Object	_____	



**COSEL**

		Temperature 25°C Testing Circuitry Figure B
Model	KHNA90F-24	
Item	Leakage Current	
Object		

## 1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	115 [V]	240 [V]	
DEN-AN	Both phases	0.25	0.26	0.38	Operation
	One of phases	0.26	0.30	0.68	Stand by
IEC60950-1	Both phases	0.14	0.16	0.36	Operation
	One of phases	0.26	0.30	0.68	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.

ModelKHNA90F-24

ItemLine Regulation

Object+24V3.8A

1.Graph

---□---

Load 50%

—△—

Load 100%

Output Voltage [V]

24.60

24.50

24.40

24.30

24.20

24.10

24.00

23.90

23.80

50

100

150

200

250

300

Input Voltage [V]

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

Temperature25°C

Testing CircuitryFigure A

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
80	24.293	24.291
85	24.292	24.291
90	24.293	24.291
100	24.293	24.292
115	24.293	24.292
200	24.293	24.292
230	24.293	24.292
264	24.293	24.292
280	24.293	24.292

# COSEL

Model		KHNA90F-24	
Item		Load Regulation	
Object		+24V3.8A	

1.Graph

—△—

Input Volt.

100V

---□---

Input Volt.

115V

---○---

Input Volt.

230V

Output Voltage [V]

24.60

24.50

24.40

24.30

24.20

24.10

24.00

23.90

23.80

0.0

1.0

2.0

3.0

4.0

5.0

Load Current [A]

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

2.Values

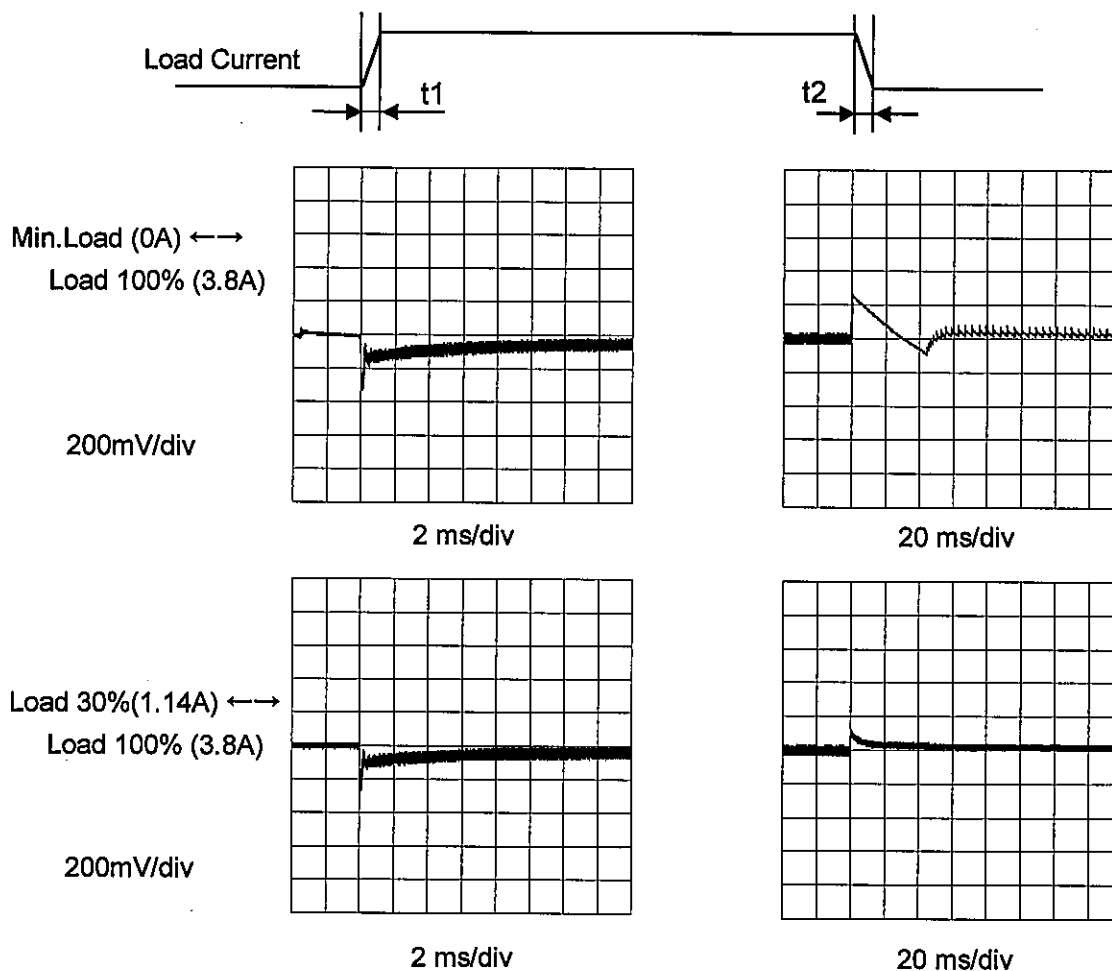
Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.00	24.296	24.296	24.296
0.15	24.296	24.296	24.296
0.30	24.296	24.296	24.296
0.60	24.296	24.296	24.296
0.90	24.295	24.295	24.295
1.20	24.295	24.295	24.295
1.80	24.294	24.294	24.294
2.40	24.293	24.294	24.294
3.00	24.293	24.293	24.293
3.80	24.292	24.292	24.292
4.18	24.291	24.291	24.291

# COSEL

Model	KHNA90F-24	Temperature Testing Circuitry	25° C Figure A
Item	Dynamic Load Response		
Object	+24V3.8A		

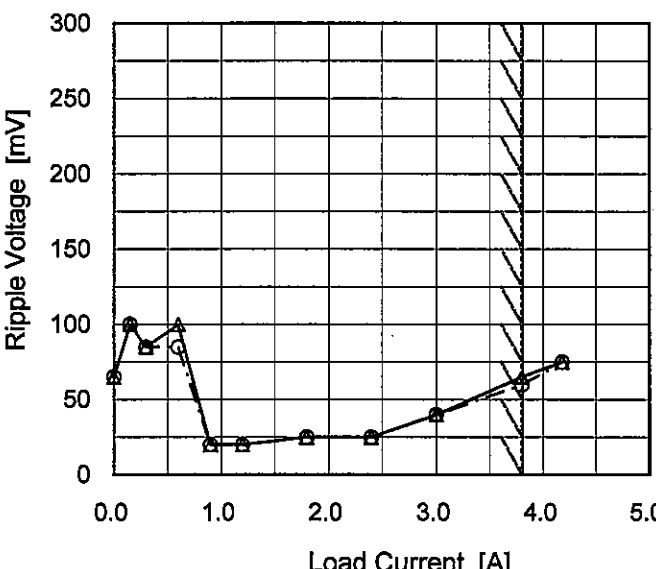
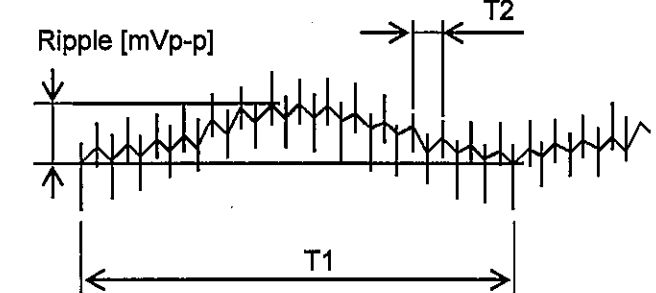
Input Volt. 230 V  
Cycle 1000 ms

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



\* The characteristic of AC115V is equal.

# COSEL

Model		KHNA90F-24																																							
Item		Ripple Voltage (by Load Current)																																							
Object		+24V3.8A																																							
1.Graph		2.Values																																							
<div><div><div>—△—</div><div>Input Volt. 115V</div></div><div><div>-○-</div><div>Input Volt. 230V</div></div></div>  <p>Measured by 20 MHz Oscilloscope. Ripple Voltage is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p>		<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>0.00</td><td>65</td><td>65</td></tr><tr><td>0.15</td><td>100</td><td>100</td></tr><tr><td>0.30</td><td>85</td><td>85</td></tr><tr><td>0.60</td><td>100</td><td>85</td></tr><tr><td>0.90</td><td>20</td><td>20</td></tr><tr><td>1.20</td><td>20</td><td>20</td></tr><tr><td>1.80</td><td>25</td><td>25</td></tr><tr><td>2.40</td><td>25</td><td>25</td></tr><tr><td>3.00</td><td>40</td><td>40</td></tr><tr><td>3.80</td><td>65</td><td>60</td></tr><tr><td>4.18</td><td>75</td><td>75</td></tr></table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 115 [V]	Input Volt. 230 [V]	0.00	65	65	0.15	100	100	0.30	85	85	0.60	100	85	0.90	20	20	1.20	20	20	1.80	25	25	2.40	25	25	3.00	40	40	3.80	65	60	4.18	75	75
Load Current [A]	Ripple Voltage [mV]																																								
	Input Volt. 115 [V]	Input Volt. 230 [V]																																							
0.00	65	65																																							
0.15	100	100																																							
0.30	85	85																																							
0.60	100	85																																							
0.90	20	20																																							
1.20	20	20																																							
1.80	25	25																																							
2.40	25	25																																							
3.00	40	40																																							
3.80	65	60																																							
4.18	75	75																																							
<div><div><div>T1: Due to AC Input Line</div><div>T2: Due to Switching</div></div><p>Fig. Complex Ripple Wave Form</p></div>																																									

Model		KHNA90F-24																																							
Item		Ripple-Noise																																							
Object		+24V3.8A																																							
1.Graph		2.Values																																							
<div><div><div>—△— Input Volt. 115V</div><div>- - -○- - - Input Volt. 230V</div></div><p>Measured by 20 MHz Oscilloscope. Ripple-Noise is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple-Noise [mV]</th></tr><tr><th>Input Volt. 115 [V]</th><th>Input Volt. 230 [V]</th></tr><tr><td>0.00</td><td>90</td><td>90</td></tr><tr><td>0.15</td><td>115</td><td>120</td></tr><tr><td>0.30</td><td>100</td><td>100</td></tr><tr><td>0.60</td><td>100</td><td>100</td></tr><tr><td>0.90</td><td>25</td><td>30</td></tr><tr><td>1.20</td><td>25</td><td>30</td></tr><tr><td>1.80</td><td>35</td><td>35</td></tr><tr><td>2.40</td><td>45</td><td>40</td></tr><tr><td>3.00</td><td>60</td><td>50</td></tr><tr><td>3.80</td><td>90</td><td>75</td></tr><tr><td>4.18</td><td>100</td><td>85</td></tr></table>		Load Current [A]	Ripple-Noise [mV]		Input Volt. 115 [V]	Input Volt. 230 [V]	0.00	90	90	0.15	115	120	0.30	100	100	0.60	100	100	0.90	25	30	1.20	25	30	1.80	35	35	2.40	45	40	3.00	60	50	3.80	90	75	4.18	100	85
Load Current [A]	Ripple-Noise [mV]																																								
	Input Volt. 115 [V]	Input Volt. 230 [V]																																							
0.00	90	90																																							
0.15	115	120																																							
0.30	100	100																																							
0.60	100	100																																							
0.90	25	30																																							
1.20	25	30																																							
1.80	35	35																																							
2.40	45	40																																							
3.00	60	50																																							
3.80	90	75																																							
4.18	100	85																																							
<div><div><div>T1: Due to AC Input Line</div><div>T2: Due to Switching</div></div><p>Fig. Complex Ripple Wave Form</p></div>																																									

# COSEL

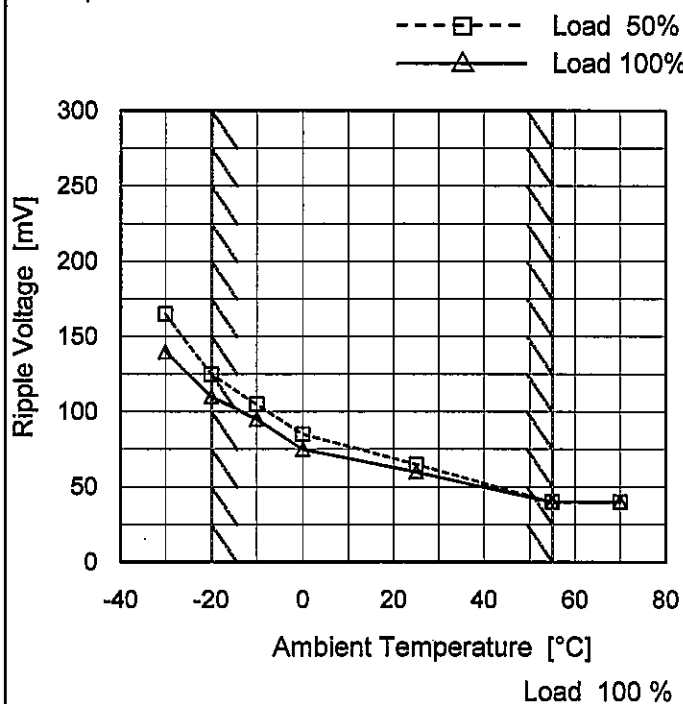
Model KHNA90F-24

Item Ripple Voltage (by Ambient Temp.)

Object +24V3.8A

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]	
	Input Volt. 115 [V]	Input Volt. 230 [V]
-30	165	140
-20	125	110
-10	105	95
0	85	75
25	65	60
55	40	40
70	40	40
--	-	-
--	-	-
--	-	-
--	-	-



# COSEL

Model	KHNA90F-24																																																						
Item	Ambient Temperature Drift																																																						
Object	+24V3.8A																																																						
1.Graph		2.Values																																																					
<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> <p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>		<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>24.254</td><td>24.254</td><td>24.254</td></tr><tr><td>-20</td><td>24.266</td><td>24.266</td><td>24.266</td></tr><tr><td>-10</td><td>24.276</td><td>24.276</td><td>24.276</td></tr><tr><td>0</td><td>24.289</td><td>24.289</td><td>24.289</td></tr><tr><td>25</td><td>24.292</td><td>24.292</td><td>24.292</td></tr><tr><td>55</td><td>24.319</td><td>24.319</td><td>24.327</td></tr><tr><td>70</td><td>24.337</td><td>24.337</td><td>24.337</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>			Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	-30	24.254	24.254	24.254	-20	24.266	24.266	24.266	-10	24.276	24.276	24.276	0	24.289	24.289	24.289	25	24.292	24.292	24.292	55	24.319	24.319	24.327	70	24.337	24.337	24.337	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																						
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]																																																				
-30	24.254	24.254	24.254																																																				
-20	24.266	24.266	24.266																																																				
-10	24.276	24.276	24.276																																																				
0	24.289	24.289	24.289																																																				
25	24.292	24.292	24.292																																																				
55	24.319	24.319	24.327																																																				
70	24.337	24.337	24.337																																																				
--	-	-	-																																																				
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**COSEL**

		Testing Circuitry Figure A
Model	KHNA90F-24	
Item	Output Voltage Accuracy	
Object	+24V3.8A	

### 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 - 55°C

Input Voltage : 85 - 264V

Load Current : 0 - 3.8A

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

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

### 2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	230	3.8	24.327	±31	±0.1
Minimum Voltage	-20	230	3.8	24.266		

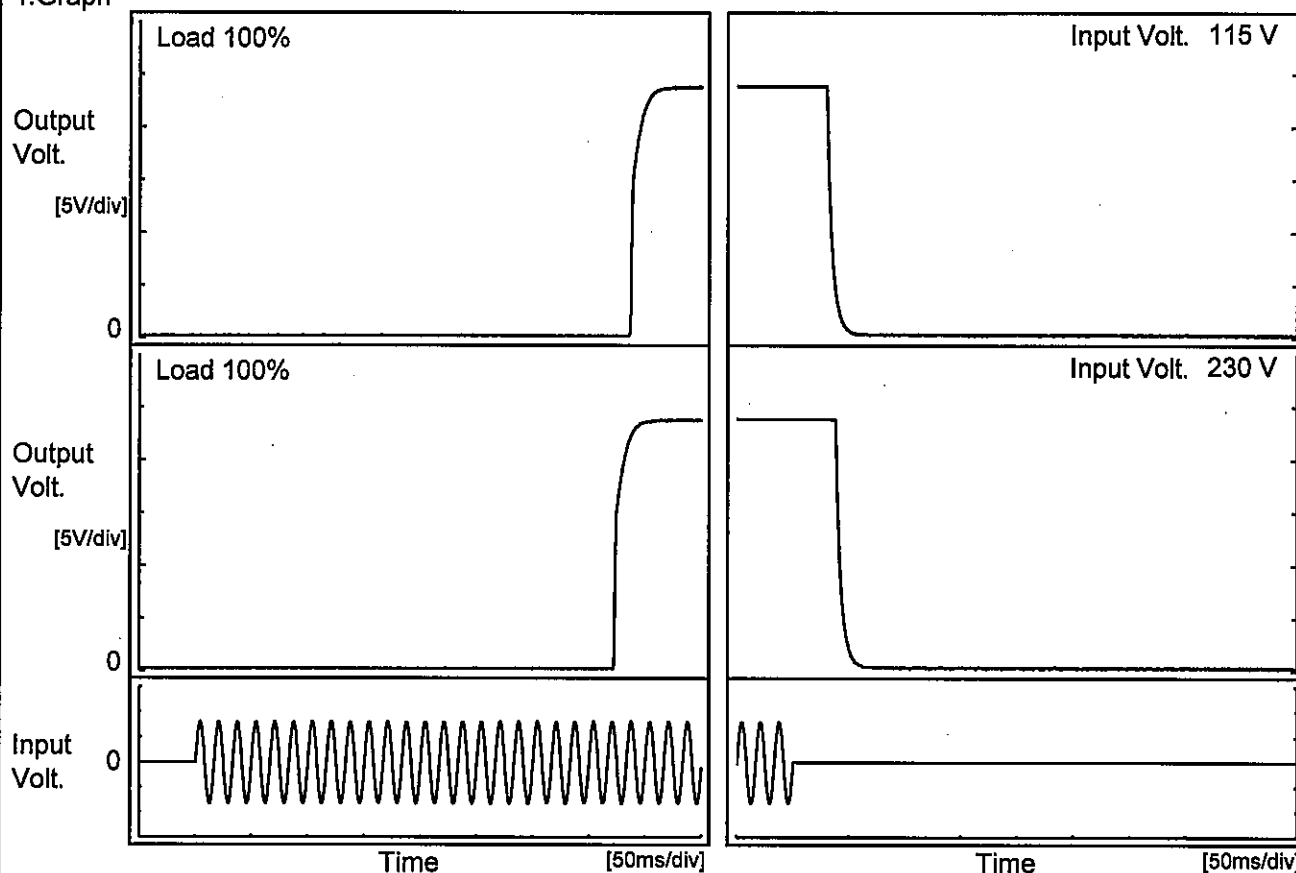


Model	KHNA90F-24		
Item	Time Lapse Drift		Temperature 25°C
Object	+24V3.8A		Testing Circuitry Figure A
1.Graph		2.Values	
<div><div>Output Voltage [V]</div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></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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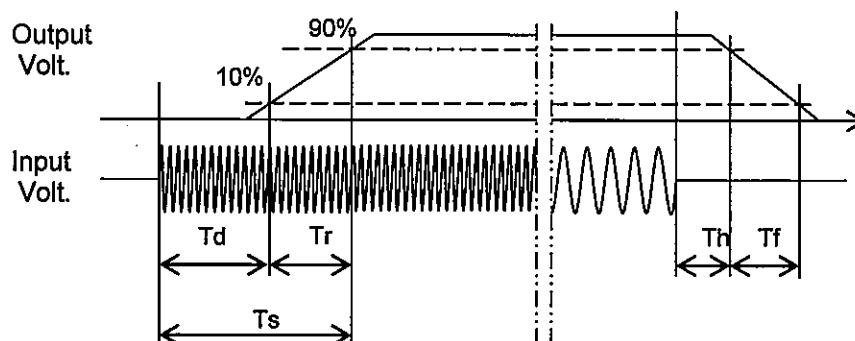
Model	KHNA90F-24	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+24V3.8A		

## 1. Graph



## 2. Values

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
115 V	387.3	13.3	400.6	30.8	10.3
230 V	373.0	13.0	386.0	38.5	10.5

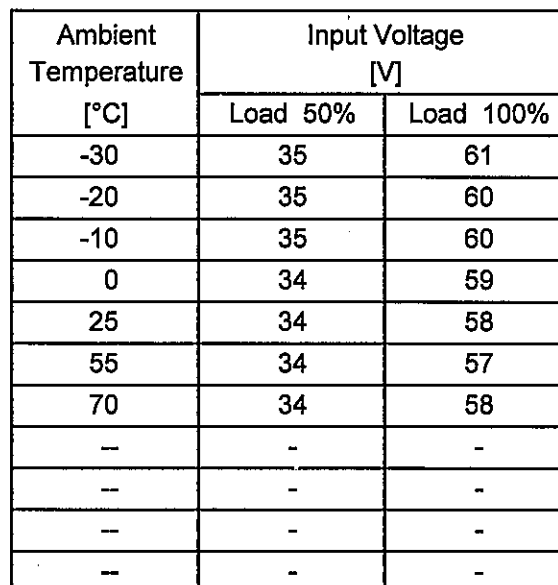




Model	KHNA90F-24																																																						
Item	Instantaneous Interruption Compensation																																																						
Object	+24V3.8A																																																						
1.Graph		2.Values																																																					
<div><div><div>—△— Input Volt. 100V</div><div>---□--- Input Volt. 115V</div><div>-○- Input Volt. 230V</div></div><div><div>Instantaneous Compensation Time [ms]</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. 100[V]</th><th>Input Volt. 115[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.00</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.15</td><td>825</td><td>849</td><td>865</td></tr><tr><td>0.30</td><td>428</td><td>436</td><td>455</td></tr><tr><td>0.60</td><td>219</td><td>225</td><td>239</td></tr><tr><td>0.90</td><td>146</td><td>151</td><td>164</td></tr><tr><td>1.20</td><td>109</td><td>113</td><td>124</td></tr><tr><td>1.80</td><td>68</td><td>72</td><td>82</td></tr><tr><td>2.40</td><td>48</td><td>52</td><td>62</td></tr><tr><td>3.00</td><td>37</td><td>40</td><td>48</td></tr><tr><td>3.80</td><td>26</td><td>30</td><td>37</td></tr><tr><td>4.18</td><td>21</td><td>26</td><td>33</td></tr></table>			Load Current [A]	Time [ms]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	0.00	-	-	-	0.15	825	849	865	0.30	428	436	455	0.60	219	225	239	0.90	146	151	164	1.20	109	113	124	1.80	68	72	82	2.40	48	52	62	3.00	37	40	48	3.80	26	30	37	4.18	21	26	33
Load Current [A]	Time [ms]																																																						
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4.18	21	26	33																																																				
Note: Slanted line shows the range of the rated load current.																																																							

### Testing Circuitry Figure A

## 2.Values



- 21 -

# COSEL

Model	KHNA90F-24																																																	
Item	Overcurrent Protection		Temperature 25°C Testing Circuitry Figure A																																															
Object	+24V3.8A																																																	
1.Graph		2.Values																																																
<div><div><div></div><div>Input Volt. 115V</div></div><div><div></div><div>Input Volt. 230V</div></div></div> <p>Note: Slanted line shows the range of the rated load current. Intermittent operation occurs when overcurrent protection is activated.</p>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="2">Load Current [A]</th></tr><tr><th>Input Volt. 115[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>24.3</td><td>5.36</td><td>5.58</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><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><tr><td>--</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]		Input Volt. 115[V]	Input Volt. 230[V]	24.3	5.36	5.58	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
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Model	KHNA90F-24
Item	Overvoltage Protection
Object	+24V3.8A

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.

Testing Circuitry    Figure A

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 115[V]	Input Volt. 230[V]
-30	31.08	30.92
-20	31.31	31.19
-10	31.40	31.38
0	31.64	31.67
25	32.34	32.41
55	33.08	33.19
70	33.47	33.55
--	-	-
--	-	-
--	-	-
--	-	-

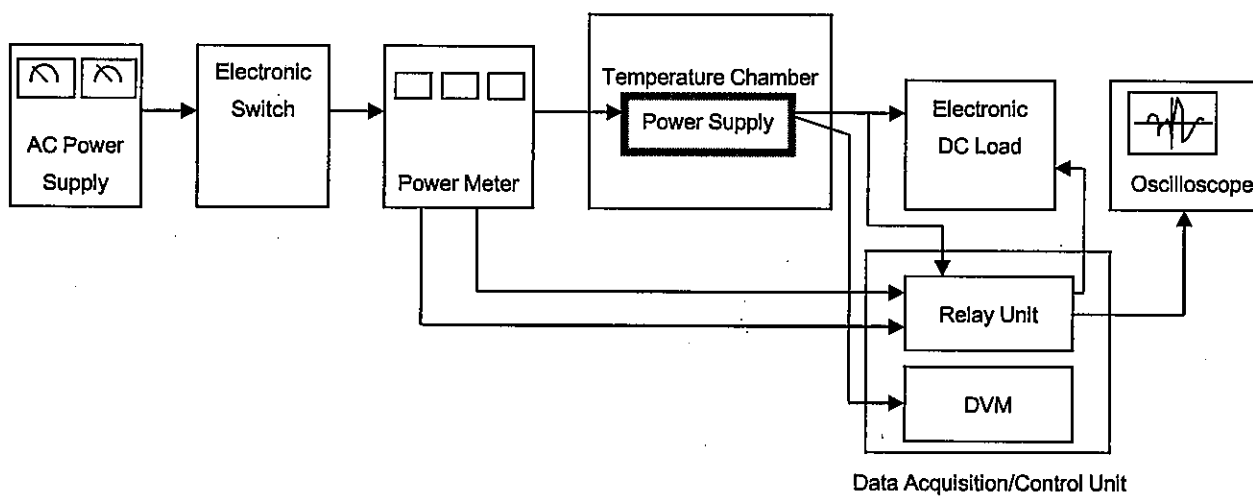


Figure A

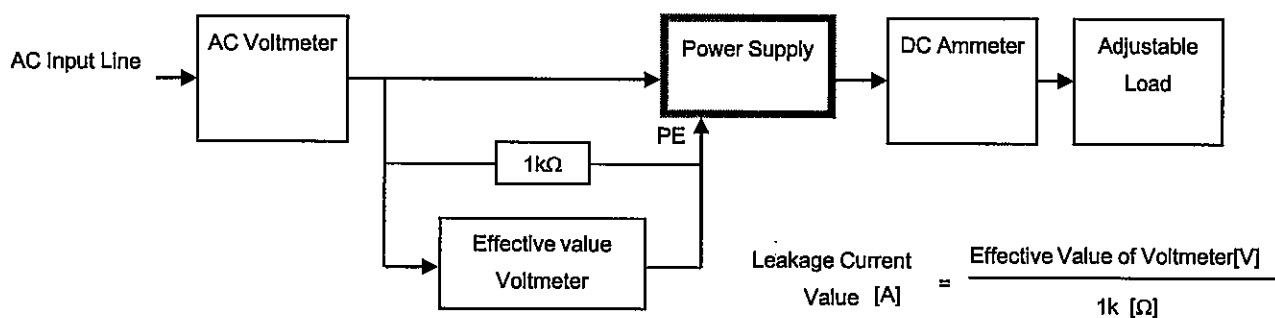


Figure B ( DEN-AN )

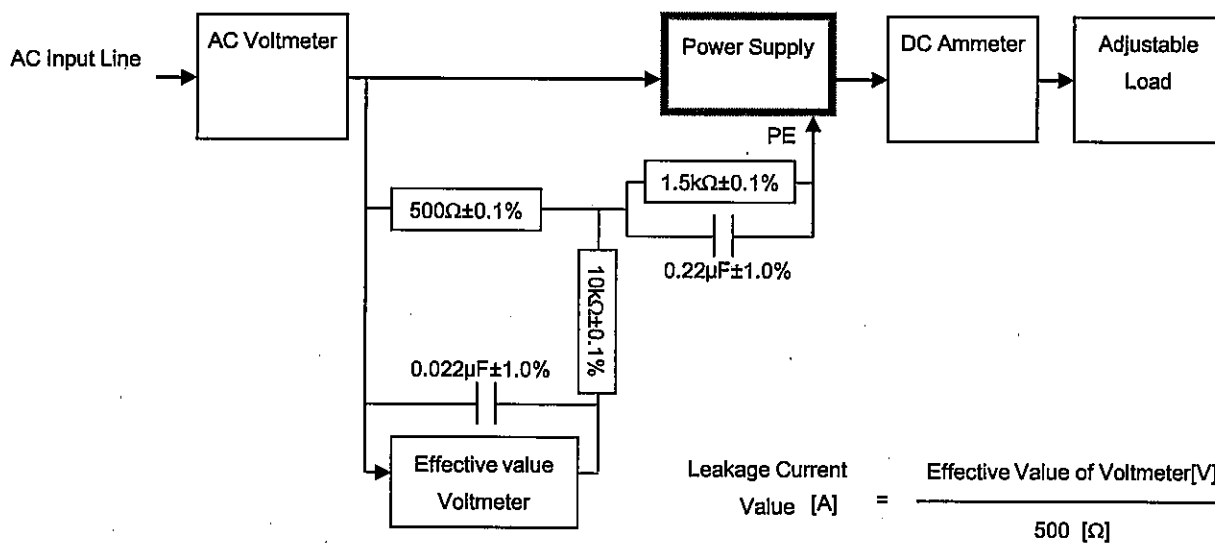


Figure B ( IEC60950-1 )

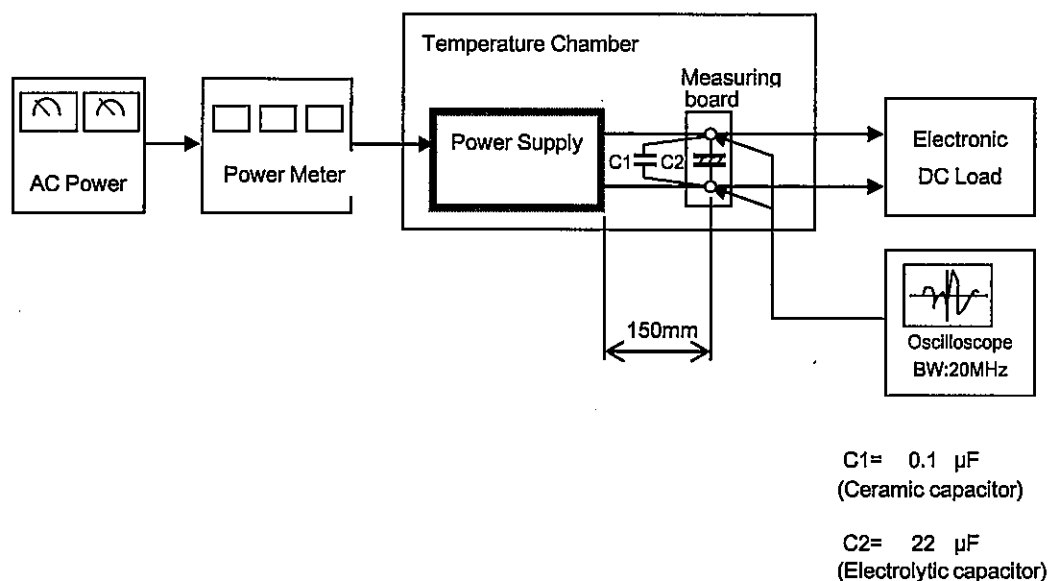


Figure C