



TEST DATA OF VAF1024

(200V INPUT)

Regulated DC Power Supply

Nov. 9, 1999

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Design Manager

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Design Engineer

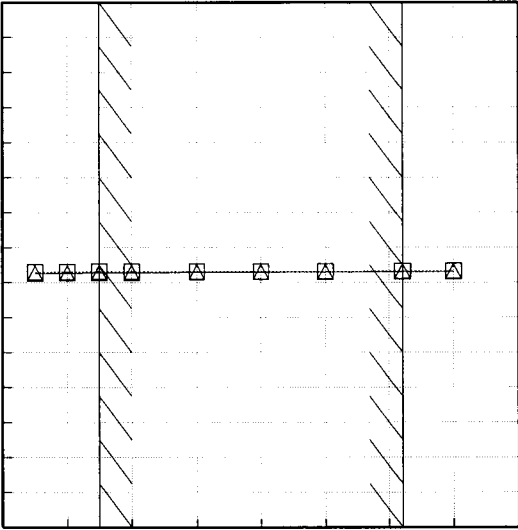
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COSEL CO., LTD.

CONTENTS

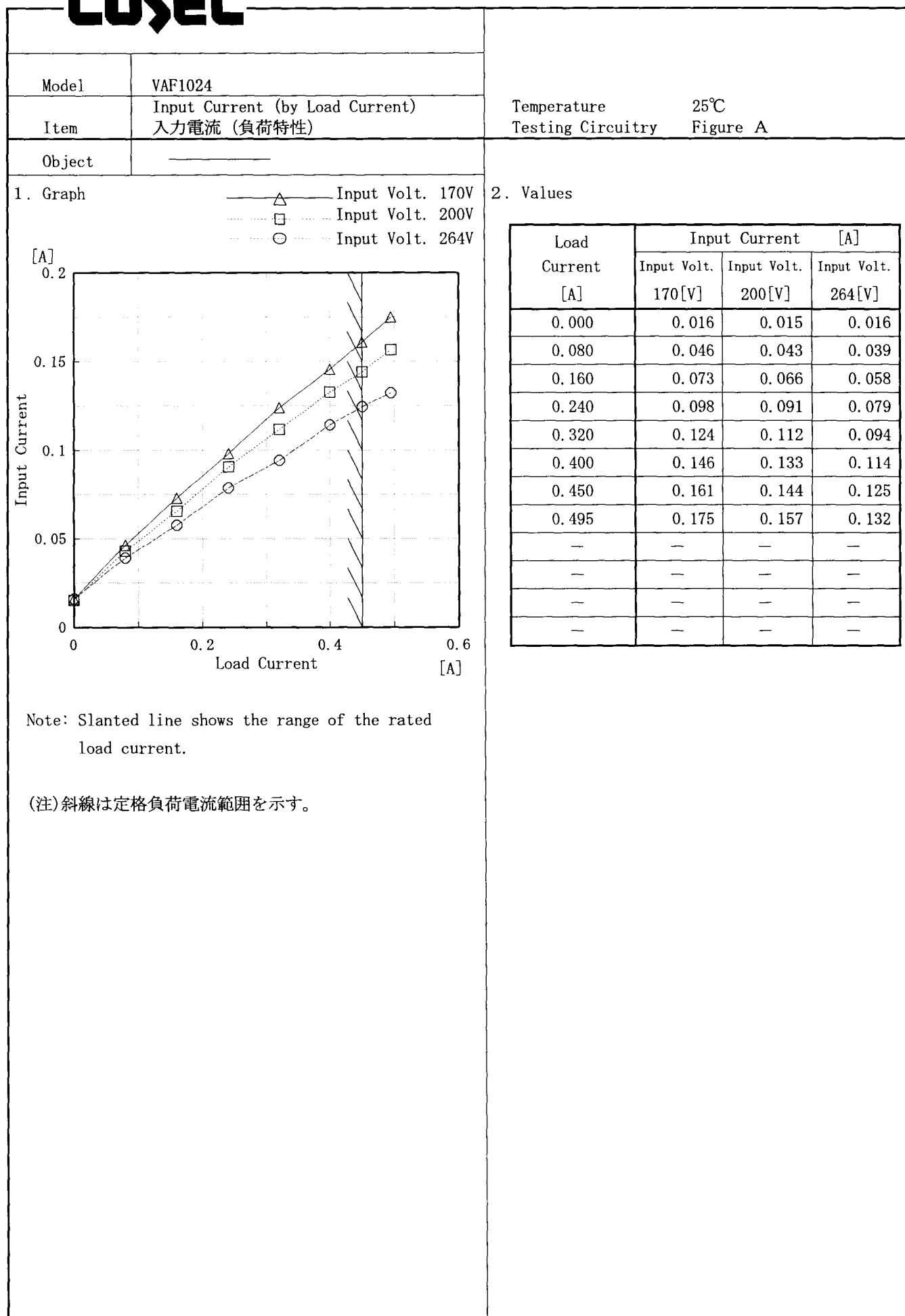
1. Line Regulation	1
静的入力変動	
2. Input Current (by Load Current)	2
入力電流 (負荷特性)	
3. Input Power (by Load Current)	3
入力電力 (負荷特性)	
4. Efficiency (by Input Voltage)	4
効率 (入力電圧特性)	
5. Efficiency (by Load Current)	5
効率 (負荷特性)	
6. Power Factor (by Input Voltage)	6
力率 (入力電圧特性)	
7. Power Factor (by Load Current)	7
力率 (負荷特性)	
8. Hold-Up Time	8
出力保持時間	
9. Instantaneous Interruption Compensation	9
瞬時停電保障	
10. Load Regulation	10
静的負荷変動	
11. Overcurrent Protection	11
過電流保護	
12. Inrush Current	12
突入電流	
13. Rise and Fall Time	13
立上り、立下り時間	
14. Ambient Temperature Drift	14
周囲温度変動	
15. Minimum Input Voltage for Regulated Output Voltage	15
最低レギュレーション電圧	
16. Time Lapse Drift	16
経時ドリフト	
17. Output Voltage Accuracy	17
定電圧精度	
18. Figure of Testing Circuitry	18
測定回路図	

(Final Page 19)

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Model		VAF1024		Temperature25℃																																	
Item		Line Regulation 静の入力変動		Testing CircuitryFigure A																																	
Object		+24.0V0.45A																																			
1. Graph		<div><div>□</div>Load 50%</div> <div><div>△</div>Load 100%</div>		2. Values																																	
<div><div>Output Voltage [V]</div><div><div><div>24.200</div><div>24.100</div><div>24.000</div><div>23.900</div><div>23.800</div><div>23.700</div><div>23.600</div><div>23.500</div></div><div><div>140</div><div>160</div><div>180</div><div>200</div><div>220</div><div>240</div><div>260</div><div>280</div><div>300</div></div><div>Input Voltage [V]</div></div></div>				<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>150</td><td>23.865</td><td>23.863</td></tr><tr><td>160</td><td>23.866</td><td>23.864</td></tr><tr><td>170</td><td>23.866</td><td>23.864</td></tr><tr><td>180</td><td>23.866</td><td>23.864</td></tr><tr><td>200</td><td>23.866</td><td>23.865</td></tr><tr><td>220</td><td>23.866</td><td>23.865</td></tr><tr><td>240</td><td>23.866</td><td>23.865</td></tr><tr><td>264</td><td>23.866</td><td>23.865</td></tr><tr><td>280</td><td>23.866</td><td>23.865</td></tr></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	150	23.865	23.863	160	23.866	23.864	170	23.866	23.864	180	23.866	23.864	200	23.866	23.865	220	23.866	23.865	240	23.866	23.865	264	23.866	23.865	280	23.866	23.865
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Note: Slanted line shows the range of the rated input voltage.																																					
(注) 斜線は定格入力電圧範囲を示す。																																					

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Model		VAF1024	Temperature		25℃
Item		Input Power (by Load Current) 入力電力（負荷特性）	Testing Circuitry		Figure A
Object					
1. Graph					
<div><div><div></div><div>△</div><div>Input Volt. 170V</div></div><div><div></div><div>□</div><div>Input Volt. 200V</div></div><div><div></div><div>○</div><div>Input Volt. 264V</div></div></div> <div><div><div>Input Power [W]</div><div>20</div><div>15</div><div>10</div><div>5</div><div>0</div></div><div><div>0</div><div>0.2</div><div>0.4</div><div>0.6</div></div><div><div>Load Current [A]</div></div></div> <div>Note: Slanted line shows the range of the rated load current.</div> <div>(注) 斜線は定格負荷電流範囲を示す。</div>					
2. Values					
Load Current [A]		Input Power [W]			
		Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]	
0.000		0.80	0.90	1.10	
0.080		2.90	3.00	3.30	
0.160		5.00	5.00	5.20	
0.240		7.10	7.30	7.70	
0.320		9.50	9.40	9.50	
0.400		11.50	11.70	12.00	
0.450		12.90	12.90	13.30	
0.495		14.30	14.20	14.30	
—		—	—	—	
—		—	—	—	
—		—	—	—	
—		—	—	—	

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Model		VAF1024	
Item		Efficiency (by Input Voltage) 効率 (入力電圧特性)	
Object			

1. Graph

□

Load 50%

△

Load 100%

Efficiency [%]

86

82

78

74

70

66

62

58

140

160

180

200

220

240

260

280

300

Input Voltage [V]

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

(注)斜線は定格入力電圧範囲を示す。

2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
150	81.3	82.2
160	81.3	82.2
170	81.3	82.2
180	81.2	82.3
200	81.2	82.2
220	81.3	82.3
240	81.3	82.2
264	81.1	82.3
280	81.3	82.3

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Model		VAF1024		Temperature		25℃																																																																																																												
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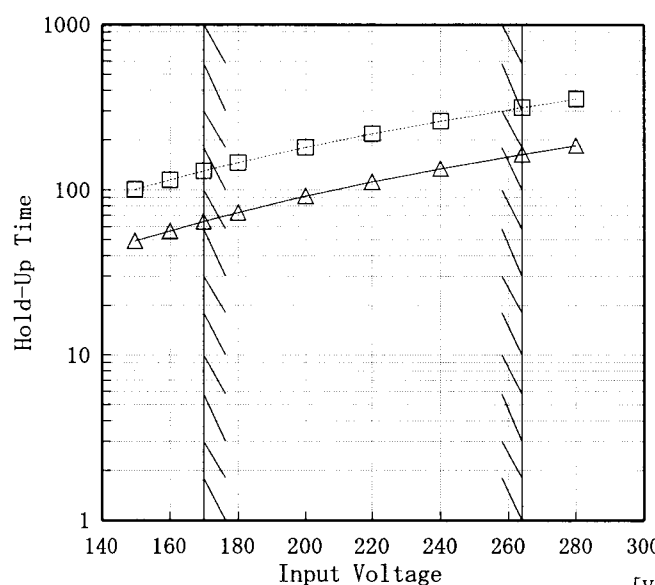
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Model		VAF1024	Temperature25℃ Testing CircuitryFigure A																															
Item		Power Factor (by Input Voltage) 力率 (入力電圧特性)																																
Object																																		
1. Graph		<div><div>□ Load 50%</div><div>△ Load 100%</div></div> <p>Power Factor</p> <p>Input Voltage [V]</p> <p>Note: Slanted line shows the range of the rated input voltage.</p> <p>(注) 斜線は定格入力電圧範囲を示す。</p>	2. Values																															
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Model		VAF1024		Temperature		25°C	
Item		Power Factor (by Load Current) 力率 (負荷特性)		Testing Circuitry		Figure A	
Object							
1. Graph				2. Values			
<div><div>—△—</div>Input Volt. 170V</div>							
<div><div>—□—</div>Input Volt. 200V</div>							
<div><div>—○—</div>Input Volt. 264V</div>							
Load Current [A]	Power Factor						
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]				
0.000	0.30	0.29	0.26				
0.080	0.37	0.35	0.32				
0.160	0.40	0.38	0.34				
0.240	0.43	0.40	0.37				
0.320	0.45	0.42	0.38				
0.400	0.46	0.44	0.40				
0.450	0.47	0.45	0.40				
0.495	0.48	0.45	0.41				
—	—	—	—				
—	—	—	—				
—	—	—	—				
—	—	—	—				

COSEL

Model			VAF1024		Temperature Testing Circuitry	25°C Figure A																														
Item			Hold-Up Time 出力保持時間																																	
Object			+24.0V0.45A																																	
1. Graph			<div><div>□</div>Load 50%</div> <div><div>△</div>Load 100%</div>		2. Values																															
<div><div>Hold-Up Time</div><div>[mS]</div><div><div>1000</div><div>100</div><div>10</div><div>1</div></div><div><div>140</div><div>160</div><div>180</div><div>200</div><div>220</div><div>240</div><div>260</div><div>280</div><div>300</div></div><div><div>Input Voltage</div><div>[V]</div></div></div>  <table><thead><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></thead><tbody><tr><td>150</td><td>101</td><td>49</td></tr><tr><td>160</td><td>115</td><td>57</td></tr><tr><td>170</td><td>131</td><td>65</td></tr><tr><td>180</td><td>147</td><td>73</td></tr><tr><td>200</td><td>181</td><td>92</td></tr><tr><td>220</td><td>219</td><td>112</td></tr><tr><td>240</td><td>261</td><td>135</td></tr><tr><td>264</td><td>316</td><td>164</td></tr><tr><td>280</td><td>356</td><td>186</td></tr></tbody></table>			Input Voltage [V]	Hold-Up Time [mS]		Load 50%	Load 100%	150	101	49	160	115	57	170	131	65	180	147	73	200	181	92	220	219	112	240	261	135	264	316	164	280	356	186		
Input Voltage [V]	Hold-Up Time [mS]																																			
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264	316	164																																		
280	356	186																																		
<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> <p>出力保持時間とは、入力電圧断から出力電圧が、定電圧精度の規格範囲を保持しているところまでの時間。</p> <p>(注)斜線は定格入力電圧範囲を示す。</p>																																				

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Model		VAF1024	
Item		Instantaneous Interruption Compensation 瞬時停電保障	
Object		+24.0V0.45A	
1. Graph		2. Values	

△

Input Volt. 170 V

□

Input Volt. 200 V

○

Input Volt. 264 V

Instantaneous Compensation Time

[mS]

1000

100

10

1

0

0.2

0.4

0.6

Load Current

[A]

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 load current.

瞬時停電保障時間とは、出力電圧が定電圧精度の規格範囲を保持している瞬時停電時間をいう。

(注)斜線は定格負荷電流範囲を示す。

Load Current [A]	Time [mS]		
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
0.000	—	—	—
0.080	318	443	768
0.160	168	242	426
0.240	118	167	284
0.320	85	119	218
0.400	69	99	176
0.450	61	86	159
0.495	54	78	144
—	—	—	—
—	—	—	—
—	—	—	—

BC-3305

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Model		VAF1024	Temperature		25℃																																																																																	
Item		Overcurrent Protection 過電流保護	Testing Circuitry		Figure A																																																																																	
Object		+24.0V0.45A																																																																																				
1. Graph			2. Values																																																																																			
<div><div><div></div><div></div><div></div></div><div>Input Volt. 170 V Input Volt. 200 V Input Volt. 264 V</div></div> <div><div>[V]</div><div>40.0</div><div>30.0</div><div>20.0</div><div>10.0</div><div>0.0</div></div> <div><div>Output Voltage</div><div></div><div></div><div></div><div></div><div></div></div> <div><div>0</div><div>0.5</div><div>1</div><div>1.5</div><div>2</div></div> <div><div></div><div></div><div></div><div></div><div></div><div></div></div> <div><div>Load Current</div><div></div><div>[A]</div></div> <div><div>Note1: Slanted line shows the range of the rated load current.</div><div>Note2: The lines shows peak current of intermittent operation of power supply when output voltage drops less than rated voltage value at overcurrent.</div><div>(注1)斜線は定格負荷電流範囲を示す。</div><div>(注2)垂下部分は間欠モード時のピーク電流を示す。</div></div> <tr><td colspan="2">Output Voltage [V]</td><td colspan="4">Load Current [A]</td></tr> <tr><td colspan="2"></td><td>Input Volt. 170[V]</td><td>Input Volt. 200[V]</td><td colspan="2">Input Volt. 264[V]</td></tr> <tr><td colspan="2">24.00</td><td>1.147</td><td>1.191</td><td colspan="2">1.271</td></tr> <tr><td colspan="2">22.80</td><td>1.147</td><td>1.206</td><td colspan="2">1.282</td></tr> <tr><td colspan="2">21.60</td><td>1.529</td><td>1.228</td><td colspan="2">1.301</td></tr> <tr><td colspan="2">19.20</td><td>1.162</td><td>1.247</td><td colspan="2">1.303</td></tr> <tr><td colspan="2">16.80</td><td>1.226</td><td>1.285</td><td colspan="2">1.359</td></tr> <tr><td colspan="2">14.40</td><td>1.326</td><td>1.385</td><td colspan="2">1.459</td></tr> <tr><td colspan="2">12.00</td><td>1.462</td><td>1.515</td><td colspan="2">1.588</td></tr> <tr><td colspan="2">9.60</td><td>1.603</td><td>1.662</td><td colspan="2">1.721</td></tr> <tr><td colspan="2">7.20</td><td>1.681</td><td>1.760</td><td colspan="2">1.805</td></tr> <tr><td colspan="2">4.80</td><td>—</td><td>—</td><td colspan="2">—</td></tr> <tr><td colspan="2">2.40</td><td>—</td><td>—</td><td colspan="2">—</td></tr> <tr><td colspan="2">0.00</td><td>—</td><td>—</td><td colspan="2">—</td></tr>			Output Voltage [V]		Load Current [A]						Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]		24.00		1.147	1.191	1.271		22.80		1.147	1.206	1.282		21.60		1.529	1.228	1.301		19.20		1.162	1.247	1.303		16.80		1.226	1.285	1.359		14.40		1.326	1.385	1.459		12.00		1.462	1.515	1.588		9.60		1.603	1.662	1.721		7.20		1.681	1.760	1.805		4.80		—	—	—		2.40		—	—	—		0.00		—	—	—	
Output Voltage [V]		Load Current [A]																																																																																				
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Note1: Slanted line shows the range of the rated load current.

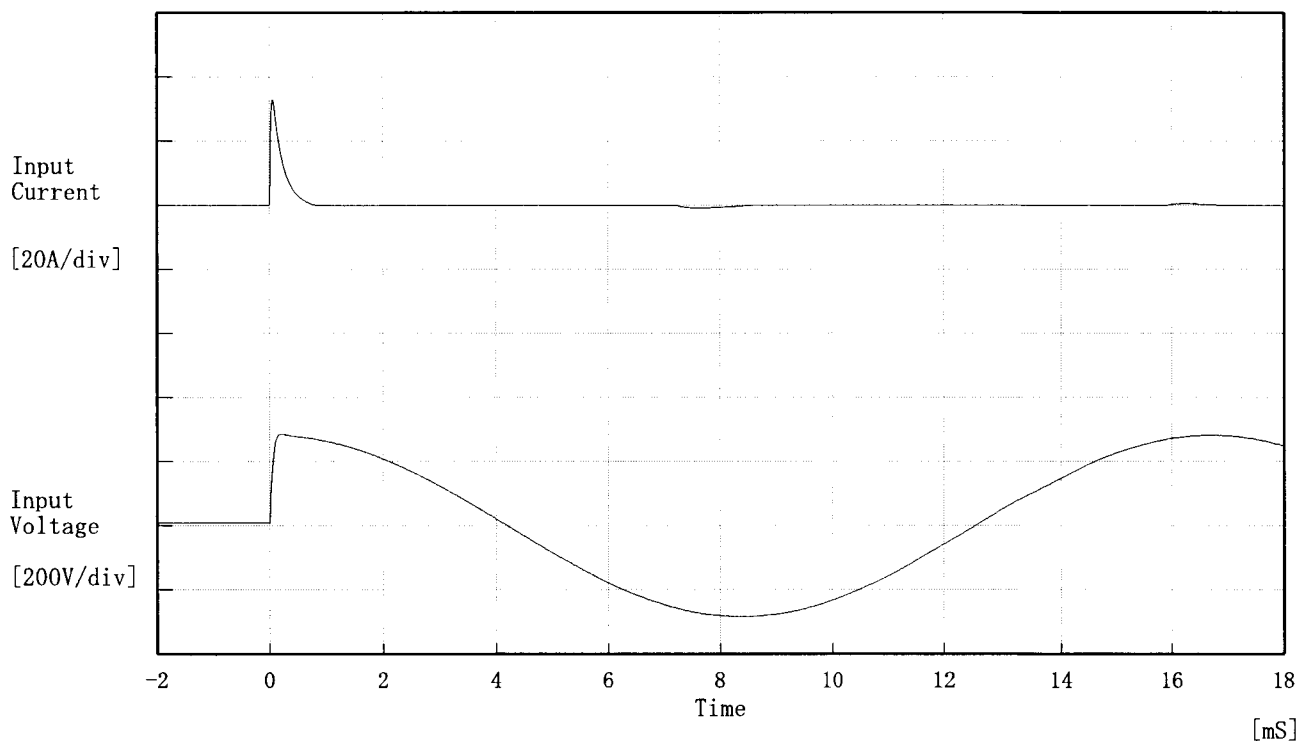
Note2: The lines shows peak current of intermittent operation of power supply when output voltage drops less than rated voltage value at overcurrent.

(注1) 斜線は定格負荷電流範囲を示す。

(注2) 垂下部分は間欠モード時のピーク電流を示す。

COSEL

Model	VAF1024	Temperature 25°C Testing Circuitry Figure A
Item	Inrush Current 突入電流	
Object	_____	



Input Voltage 200 V

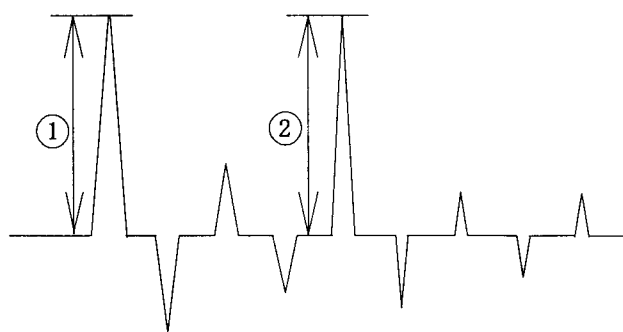
Frequency 60 Hz

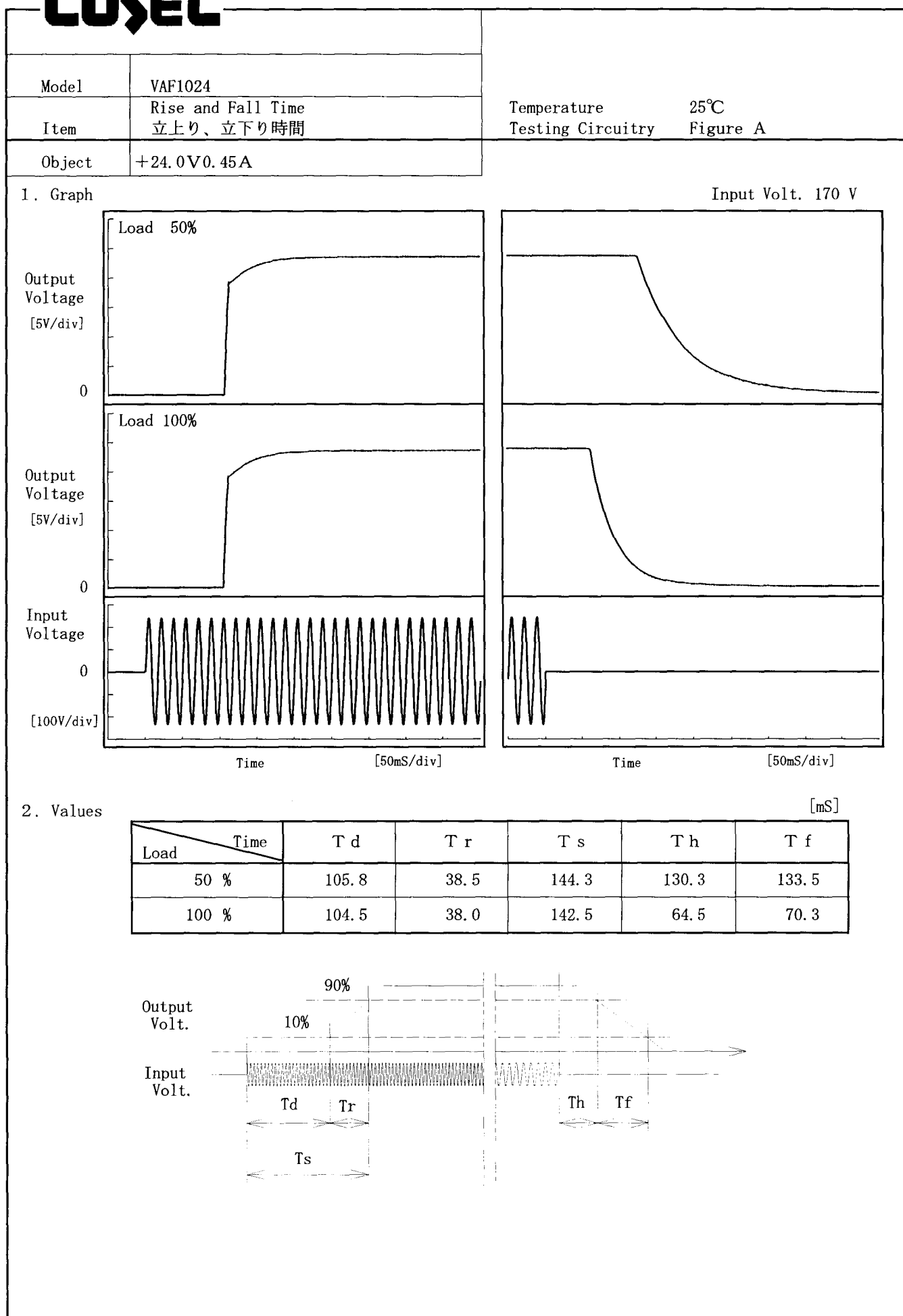
Load 100 %

Inrush Current

① 32.91 [A]

② 0.98 [A]



COSEL

COSEL

Model		VAF1024	
Item		Ambient Temperature Drift 周囲温度変動	
Object		+24.0V0.45A	
1. Graph		2. Values	

△

Input Volt. 170V

□

Input Volt. 200V

○

Input Volt. 264V

Output Voltage [V]

24.200

24.100

24.000

23.900

23.800

23.700

23.600

23.500

-40

0

40

80

Ambient Temperature [°C]

Load 100%

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
-30	23.848	23.849	23.850
-20	23.849	23.850	23.851
-10	23.851	23.852	23.853
0	23.855	23.856	23.857
10	23.860	23.860	23.861
25	23.862	23.862	23.863
30	23.862	23.863	23.864
40	23.857	23.857	23.858
55	23.843	23.844	23.844
60	23.834	23.835	23.836
—	—	—	—

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

(注)斜線は定格周囲温度範囲を示す。

Ambient Temperature [°C]

Output Voltage [V]

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
-30	23.848	23.849	23.850
-20	23.849	23.850	23.851
-10	23.851	23.852	23.853
0	23.855	23.856	23.857
10	23.860	23.860	23.861
25	23.862	23.862	23.863
30	23.862	23.863	23.864
40	23.857	23.857	23.858
55	23.843	23.844	23.844
60	23.834	23.835	23.836
—	—	—	—

COSEL

Model		VAF1024	
Item		Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧	
Object		+24.0V0.45A	

1. Graph

□

Load 50%

△

Load 100%

Input Voltage [V]

100.0

80.0

60.0

40.0

20.0

0.0

-40

0

40

80

Ambient Temperature [°C]

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

(注) 斜線は定格周囲温度範囲を示す。

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-30	37	48
-20	37	48
-10	37	49
0	36	50
10	37	52
25	38	52
30	38	53
40	39	55
55	39	56
60	39	56
—	—	—

2. Values

COSEL

COSEL																									
Model	VAF1024																								
Item	Time Lapse Drift 経時ドリフト	Temperature	25℃																						
		Testing Circuitry	Figure A																						
Object	+24.0V0.45A																								
1. Graph		2.Values																							
<div>[V]</div> <div><p>Output Voltage</p><p>Time [H]</p><p>Input Volt. 200V</p><p>Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>23.856</td></tr><tr><td>0.5</td><td>23.851</td></tr><tr><td>1.0</td><td>23.851</td></tr><tr><td>2.0</td><td>23.851</td></tr><tr><td>3.0</td><td>23.851</td></tr><tr><td>4.0</td><td>23.851</td></tr><tr><td>5.0</td><td>23.851</td></tr><tr><td>6.0</td><td>23.852</td></tr><tr><td>7.0</td><td>23.852</td></tr><tr><td>8.0</td><td>23.852</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	23.856	0.5	23.851	1.0	23.851	2.0	23.851	3.0	23.851	4.0	23.851	5.0	23.851	6.0	23.852	7.0	23.852	8.0	23.852
Time since start [H]	Output Voltage [V]																								
0.0	23.856																								
0.5	23.851																								
1.0	23.851																								
2.0	23.851																								
3.0	23.851																								
4.0	23.851																								
5.0	23.851																								
6.0	23.852																								
7.0	23.852																								
8.0	23.852																								

COSEL

Model	VAF1024	Testing Circuitry Figure A
Item	Output Voltage Accuracy 定電圧精度	
Object	+24.0V0.45A	

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 : -10~55 °C

Input Voltage : 170~264 V

Load Current : 0~0.45 A

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

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

1. 定電圧精度

周囲温度、入力電圧、負荷電流を下記仕様内で、任意に変動させたときの出力電圧の変動をいう。

周囲温度 -10~55 °C

入力電圧 170~264 V

負荷電流 0~0.45 A

* 定電圧精度(変動値) = $\pm (\text{出力電圧の最高値} - \text{出力電圧の最低値}) / 2$

* 定電圧精度(変動率) = $\frac{\text{変動値}}{\text{定格出力電圧}} \times 100$

2. Values

Item	Temperature [°C]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy (Ratio) [%]
Maximum Voltage	25	264	0.00	23.868	±13	±0.1
Minimum Voltage	55	170	0.45	23.844		

COSEL

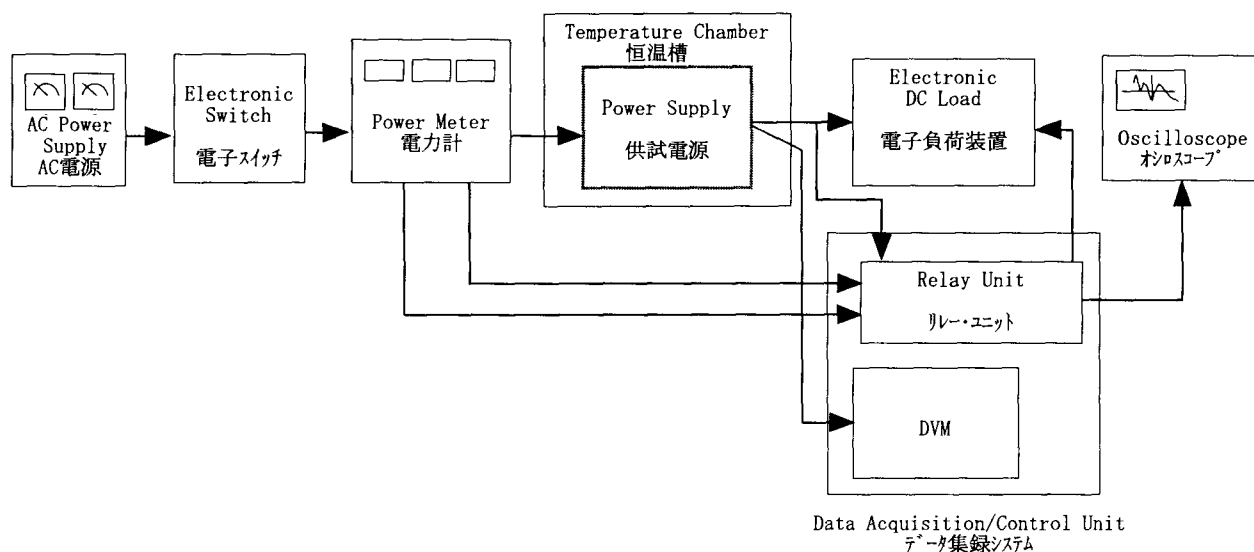


Figure A

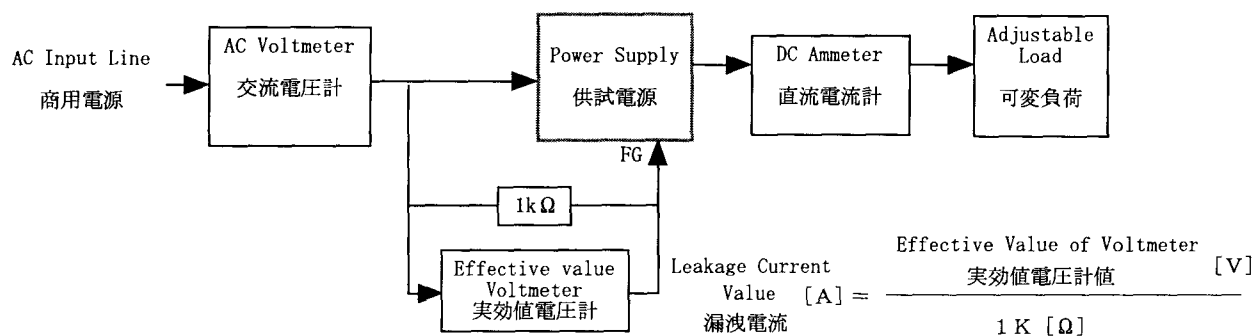


Figure B (DENTORI)

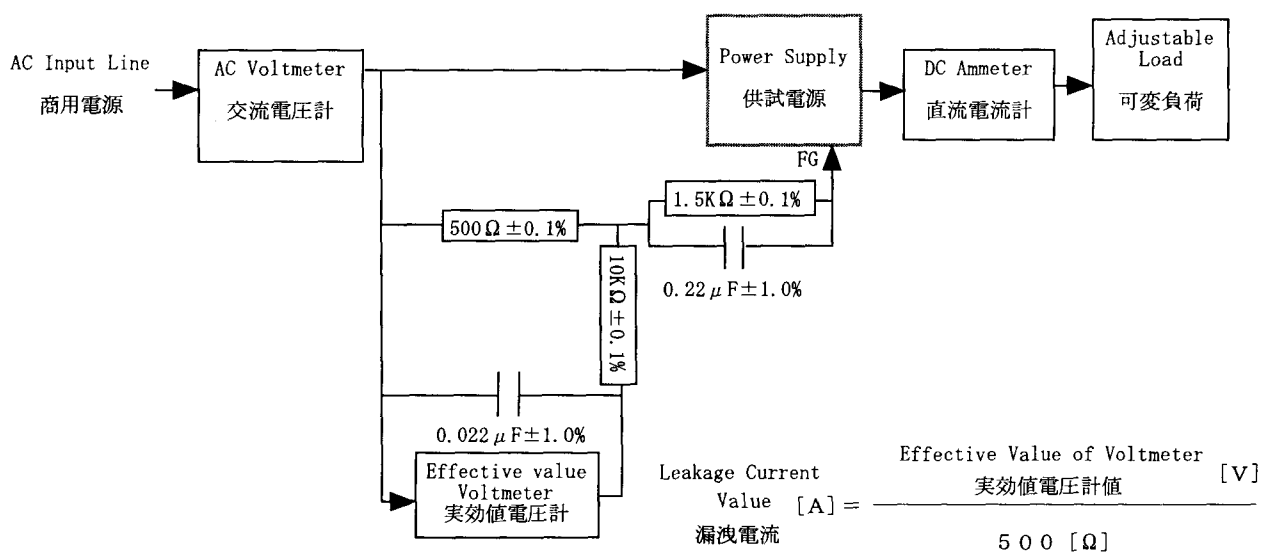


Figure B (IEC60950)

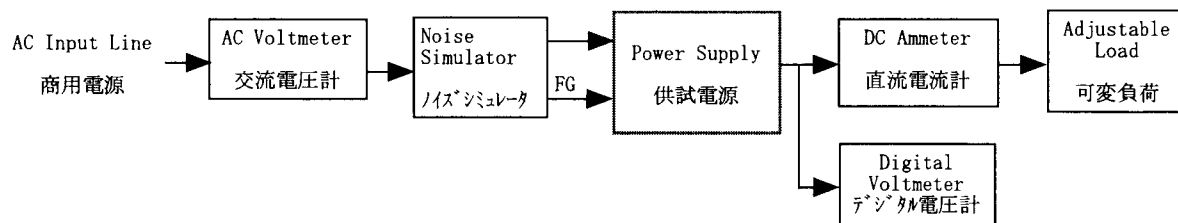


Figure C

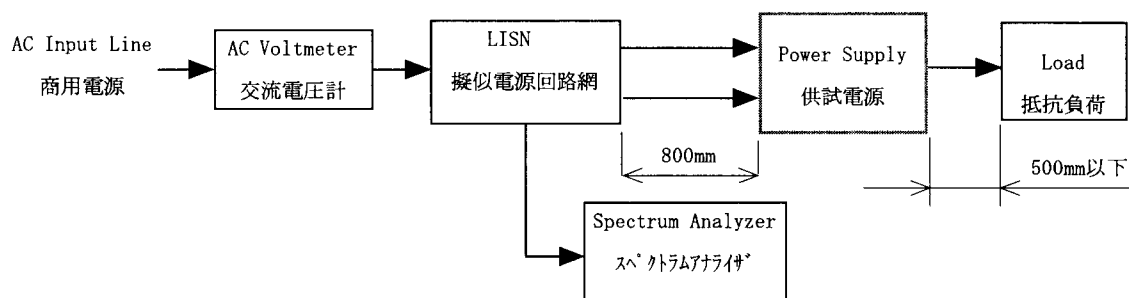


Figure D

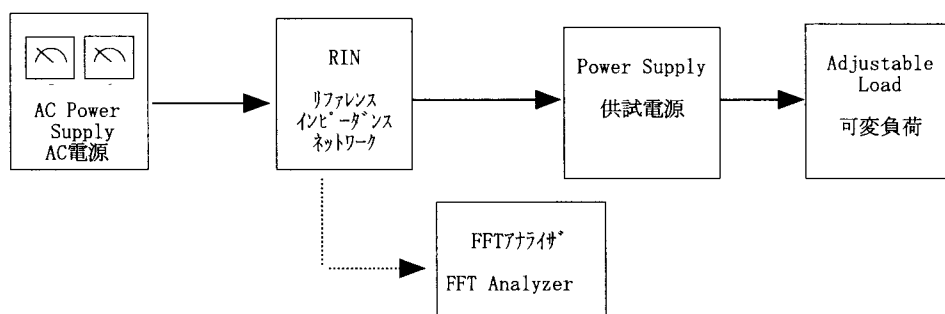


Figure E