



# TEST DATA OF VAF512

(200V INPUT)

Regulated DC Power Supply

Date : May 28. 1999

Approved by : T. Yoneda  
Design Manager

Prepared by : Y. Hirose  
Design Engineer

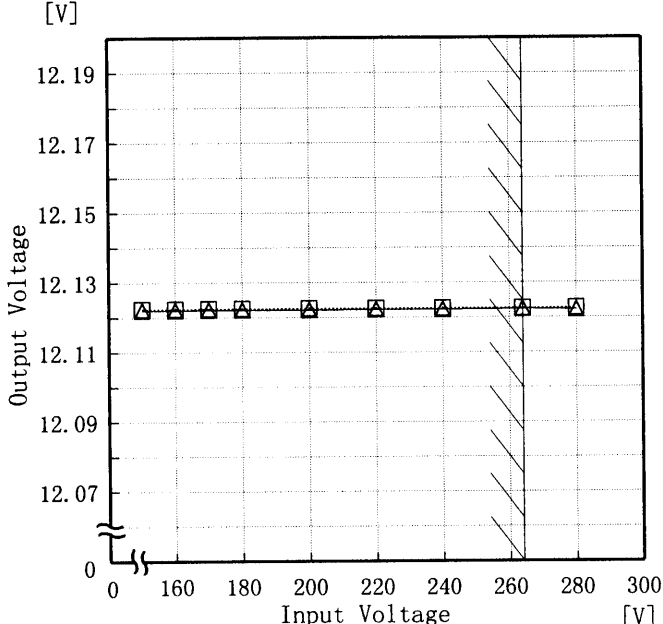
コーセル株式会社  
COSEL CO., LTD.

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. Ripple Voltage (by Load Current) . . . . .	11
リップル電圧 (負荷特性)	
12. Ripple-Noise . . . . .	12
リップルノイズ	
13. Overcurrent Protection . . . . .	13
過電流保護	
14. Inrush Current . . . . .	14
突入電流	
15. Dynamic Load Responce . . . . .	15
動的負荷変動	
16. Rise and Fall Time . . . . .	16
立上り、立下がり時間	
17. Ambient Temperature Drift . . . . .	17
周囲温度変動	
18. Minimum Input Voltage for Regulated Output Voltage . . . . .	18
最低レギュレーション電圧	
19. Ripple Voltage (by Ambient Temperature) . . . . .	19
リップル電圧 (周囲温度特性)	
20. Time Lapse Drift . . . . .	20
経時ドリフト	
21. Output Voltage Accuracy . . . . .	21
定電圧精度	
22. Oscillator Frequency . . . . .	22
発振周波数	
23. Condensation . . . . .	23
結露特性	
24. Leakage Current . . . . .	24
漏洩電流	
25. Line Noise Tolerance . . . . .	25
入力雑音耐量	
26. Conducted Emission . . . . .	26
雑音端子電圧	
27. Figure of Testing Circuitry . . . . .	27
測定回路図	

(Final Page 28 )

# COSEL

Model VAF512		Temperature 25°C Testing Circuitry Figure A																																
Item	Line Regulation 静的入力変動																																	
Object	+12.0V0.45A																																	
<p>1. Graph</p> <p>□ Load 50% △ Load 100%</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>		<p>2. Values</p> <table border="1"> <thead> <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> </thead> <tbody> <tr><td>150</td><td>12.123</td><td>12.122</td></tr> <tr><td>160</td><td>12.123</td><td>12.122</td></tr> <tr><td>170</td><td>12.123</td><td>12.122</td></tr> <tr><td>180</td><td>12.123</td><td>12.122</td></tr> <tr><td>200</td><td>12.123</td><td>12.122</td></tr> <tr><td>220</td><td>12.123</td><td>12.122</td></tr> <tr><td>240</td><td>12.123</td><td>12.122</td></tr> <tr><td>264</td><td>12.123</td><td>12.122</td></tr> <tr><td>280</td><td>12.123</td><td>12.122</td></tr> </tbody> </table>	Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	150	12.123	12.122	160	12.123	12.122	170	12.123	12.122	180	12.123	12.122	200	12.123	12.122	220	12.123	12.122	240	12.123	12.122	264	12.123	12.122	280	12.123	12.122
Input Voltage [V]	Output Voltage [V]																																	
	Load 50%	Load 100%																																
150	12.123	12.122																																
160	12.123	12.122																																
170	12.123	12.122																																
180	12.123	12.122																																
200	12.123	12.122																																
220	12.123	12.122																																
240	12.123	12.122																																
264	12.123	12.122																																
280	12.123	12.122																																

# COSEL

Model		VAF512		Temperature		25℃																																																								
Item		Input Current (by Load Current) 入力電流（負荷特性）		Testing Circuitry		Figure A																																																								
Output		_____																																																												
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> <p>Note: Slanted line shows the range of the rated load current</p> <p>(注) 斜線は定格負荷電流範囲を示す。</p>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input Current [A]</th></tr><tr><th>Input Volt. 170[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 264[V]</th></tr><tr><td>0.000</td><td>0.010</td><td>0.010</td><td>0.011</td></tr><tr><td>0.080</td><td>0.027</td><td>0.025</td><td>0.023</td></tr><tr><td>0.160</td><td>0.042</td><td>0.039</td><td>0.036</td></tr><tr><td>0.240</td><td>0.058</td><td>0.052</td><td>0.045</td></tr><tr><td>0.320</td><td>0.070</td><td>0.065</td><td>0.057</td></tr><tr><td>0.400</td><td>0.083</td><td>0.075</td><td>0.065</td></tr><tr><td>0.450</td><td>0.093</td><td>0.084</td><td>0.070</td></tr><tr><td>0.495</td><td>0.100</td><td>0.091</td><td>0.077</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr></table>				Load Current [A]	Input Current [A]			Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]	0.000	0.010	0.010	0.011	0.080	0.027	0.025	0.023	0.160	0.042	0.039	0.036	0.240	0.058	0.052	0.045	0.320	0.070	0.065	0.057	0.400	0.083	0.075	0.065	0.450	0.093	0.084	0.070	0.495	0.100	0.091	0.077	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Load Current [A]	Input Current [A]																																																													
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]																																																											
0.000	0.010	0.010	0.011																																																											
0.080	0.027	0.025	0.023																																																											
0.160	0.042	0.039	0.036																																																											
0.240	0.058	0.052	0.045																																																											
0.320	0.070	0.065	0.057																																																											
0.400	0.083	0.075	0.065																																																											
0.450	0.093	0.084	0.070																																																											
0.495	0.100	0.091	0.077																																																											
—	—	—	—																																																											
—	—	—	—																																																											
—	—	—	—																																																											
—	—	—	—																																																											

# COSEL

Model		VAF512		Temperature		25℃																																																								
Item		Input Power (by Load Current) 入力電力（負荷特性）		Testing Circuitry		Figure A																																																								
Output		_____																																																												
1. Graph				2. Values																																																										
<div><div><div>—△—</div><div>—□—</div><div>—○—</div></div><div><div>Input Volt. 170V</div><div>Input Volt. 200V</div><div>Input Volt. 264V</div></div></div> <div><div><div>Input Power [W]</div><div>10</div><div>8</div><div>6</div><div>4</div><div>2</div><div>0</div></div><div><div>Load Current [A]</div><div>0.6</div><div>0.4</div><div>0.2</div><div>0</div></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></div>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Input Power [W]</th></tr><tr><th>Input Volt. 170[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 264[V]</th></tr><tr><td>0.000</td><td>0.50</td><td>0.50</td><td>0.80</td></tr><tr><td>0.080</td><td>1.60</td><td>1.60</td><td>1.80</td></tr><tr><td>0.160</td><td>2.60</td><td>2.80</td><td>3.00</td></tr><tr><td>0.240</td><td>3.90</td><td>3.90</td><td>4.00</td></tr><tr><td>0.320</td><td>4.90</td><td>5.10</td><td>5.30</td></tr><tr><td>0.400</td><td>6.10</td><td>6.00</td><td>6.30</td></tr><tr><td>0.450</td><td>6.90</td><td>6.90</td><td>6.90</td></tr><tr><td>0.495</td><td>7.50</td><td>7.60</td><td>7.70</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr></table>				Load Current [A]	Input Power [W]			Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]	0.000	0.50	0.50	0.80	0.080	1.60	1.60	1.80	0.160	2.60	2.80	3.00	0.240	3.90	3.90	4.00	0.320	4.90	5.10	5.30	0.400	6.10	6.00	6.30	0.450	6.90	6.90	6.90	0.495	7.50	7.60	7.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Load Current [A]	Input Power [W]																																																													
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]																																																											
0.000	0.50	0.50	0.80																																																											
0.080	1.60	1.60	1.80																																																											
0.160	2.60	2.80	3.00																																																											
0.240	3.90	3.90	4.00																																																											
0.320	4.90	5.10	5.30																																																											
0.400	6.10	6.00	6.30																																																											
0.450	6.90	6.90	6.90																																																											
0.495	7.50	7.60	7.70																																																											
—	—	—	—																																																											
—	—	—	—																																																											
—	—	—	—																																																											
—	—	—	—																																																											

**COSEL**

Model VAF512		Temperature 25°C Testing Circuitry Figure A																																
Item	Efficiency 効率																																	
Object																																		
<p>1. Graph</p> <p>□ Load 50% △ Load 100%</p> <p>Efficiency [%]</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>		<p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th><th colspan="2">Efficiency [%]</th></tr> <tr> <th>Load 50%</th><th>Load 100%</th></tr> </thead> <tbody> <tr><td>150</td><td>75.4</td><td>79.7</td></tr> <tr><td>160</td><td>75.5</td><td>79.7</td></tr> <tr><td>170</td><td>75.5</td><td>79.7</td></tr> <tr><td>180</td><td>75.5</td><td>79.7</td></tr> <tr><td>200</td><td>75.5</td><td>79.7</td></tr> <tr><td>220</td><td>75.4</td><td>79.7</td></tr> <tr><td>240</td><td>75.5</td><td>79.7</td></tr> <tr><td>264</td><td>75.5</td><td>79.7</td></tr> <tr><td>280</td><td>75.5</td><td>79.7</td></tr> </tbody> </table>	Input Voltage [V]	Efficiency [%]		Load 50%	Load 100%	150	75.4	79.7	160	75.5	79.7	170	75.5	79.7	180	75.5	79.7	200	75.5	79.7	220	75.4	79.7	240	75.5	79.7	264	75.5	79.7	280	75.5	79.7
Input Voltage [V]	Efficiency [%]																																	
	Load 50%	Load 100%																																
150	75.4	79.7																																
160	75.5	79.7																																
170	75.5	79.7																																
180	75.5	79.7																																
200	75.5	79.7																																
220	75.4	79.7																																
240	75.5	79.7																																
264	75.5	79.7																																
280	75.5	79.7																																

**COSEL**

Model		VAF512	
Item	Efficiency (by Load Current) 効率 (負荷電流特性)		
Output	_____		

1. Graph

—△—

—□—

—○—

Input Volt. 170V

Input Volt. 200V

Input Volt. 264V

Efficiency [%]

Load Current [A]

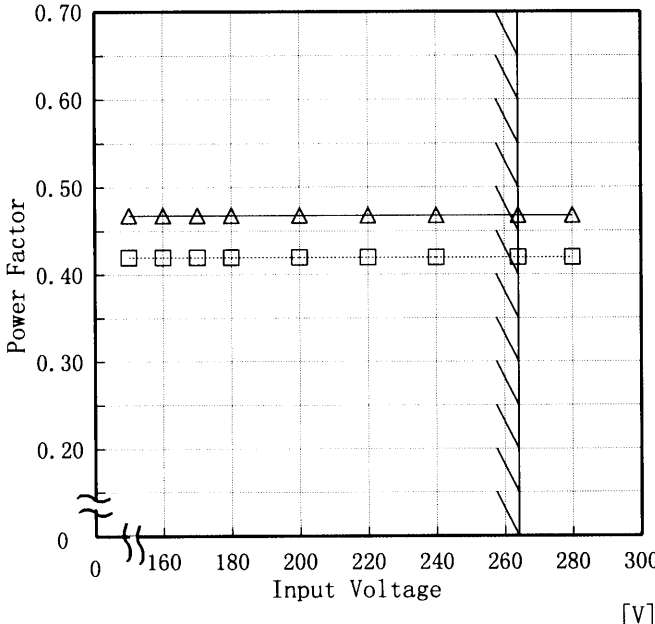
Note: Slanted line shows the range of the rated load current

(注) 斜線は定格負荷電流範囲を示す。

2. Values

Load Current [A]	Efficiency [%]		
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
0.080	60.8	60.7	53.9
0.160	74.5	69.2	64.6
0.240	74.6	74.6	72.8
0.320	79.1	76.0	73.2
0.400	79.3	80.6	76.8
0.450	79.0	79.0	79.0
0.495	79.9	78.9	77.8
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

# COSEL

Model VAF512		Temperature 25°C Testing Circuitry Figure A																																
Item	Power Factor (by Input Voltage) 力率 (入力電圧特性)																																	
Object																																		
<p>1. Graph</p> <p>-----□----- Load 50% ———△——— Load 100%</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>		<p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th><th colspan="2">Power Factor</th></tr> <tr> <th>Load 50%</th><th>Load 100%</th></tr> </thead> <tbody> <tr><td>150</td><td>0.42</td><td>0.47</td></tr> <tr><td>160</td><td>0.42</td><td>0.47</td></tr> <tr><td>170</td><td>0.42</td><td>0.47</td></tr> <tr><td>180</td><td>0.42</td><td>0.47</td></tr> <tr><td>200</td><td>0.42</td><td>0.47</td></tr> <tr><td>220</td><td>0.42</td><td>0.47</td></tr> <tr><td>240</td><td>0.42</td><td>0.47</td></tr> <tr><td>264</td><td>0.42</td><td>0.47</td></tr> <tr><td>280</td><td>0.42</td><td>0.47</td></tr> </tbody> </table>	Input Voltage [V]	Power Factor		Load 50%	Load 100%	150	0.42	0.47	160	0.42	0.47	170	0.42	0.47	180	0.42	0.47	200	0.42	0.47	220	0.42	0.47	240	0.42	0.47	264	0.42	0.47	280	0.42	0.47
Input Voltage [V]	Power Factor																																	
	Load 50%	Load 100%																																
150	0.42	0.47																																
160	0.42	0.47																																
170	0.42	0.47																																
180	0.42	0.47																																
200	0.42	0.47																																
220	0.42	0.47																																
240	0.42	0.47																																
264	0.42	0.47																																
280	0.42	0.47																																



# COSEL

Model		VAF512		Temperature		25℃																																																								
Item		Power Factor (by Load Current) 力率 (負荷電流特性)		Testing Circuitry		Figure A																																																								
Output		_____																																																												
1. Graph				2. Values																																																										
<div><div>—△—</div><div>Input Volt. 170V</div></div> <div><div>---□---</div><div>Input Volt. 200V</div></div> <div><div>---○---</div><div>Input Volt. 264V</div></div> <p>Note: Slanted line shows the range of the rated load current</p> <p>(注)斜線は定格負荷電流範囲を示す。</p>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Power Factor</th></tr><tr><th>Input Volt. 170[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 264[V]</th></tr><tr><td>0.000</td><td>0.31</td><td>0.25</td><td>0.27</td></tr><tr><td>0.080</td><td>0.35</td><td>0.32</td><td>0.31</td></tr><tr><td>0.160</td><td>0.37</td><td>0.36</td><td>0.32</td></tr><tr><td>0.240</td><td>0.39</td><td>0.37</td><td>0.34</td></tr><tr><td>0.320</td><td>0.41</td><td>0.39</td><td>0.35</td></tr><tr><td>0.400</td><td>0.43</td><td>0.40</td><td>0.37</td></tr><tr><td>0.450</td><td>0.44</td><td>0.41</td><td>0.37</td></tr><tr><td>0.495</td><td>0.44</td><td>0.42</td><td>0.38</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr></table>				Load Current [A]	Power Factor			Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]	0.000	0.31	0.25	0.27	0.080	0.35	0.32	0.31	0.160	0.37	0.36	0.32	0.240	0.39	0.37	0.34	0.320	0.41	0.39	0.35	0.400	0.43	0.40	0.37	0.450	0.44	0.41	0.37	0.495	0.44	0.42	0.38	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Load Current [A]	Power Factor																																																													
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]																																																											
0.000	0.31	0.25	0.27																																																											
0.080	0.35	0.32	0.31																																																											
0.160	0.37	0.36	0.32																																																											
0.240	0.39	0.37	0.34																																																											
0.320	0.41	0.39	0.35																																																											
0.400	0.43	0.40	0.37																																																											
0.450	0.44	0.41	0.37																																																											
0.495	0.44	0.42	0.38																																																											
—	—	—	—																																																											
—	—	—	—																																																											
—	—	—	—																																																											
—	—	—	—																																																											

# COSEL

Model VAF512		Temperature 25°C Testing Circuitry Figure A																																
Item	Hold-Up Time 出力保持時間																																	
Object	+12.0V0.45A																																	
<p>1. Graph</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">□ ——— Load 50%</div> <div style="text-align: center;">—△— Load 100%</div> </div> <p>Hold-Up Time [mS]</p> <p>Input Voltage [V]</p>		2. Values																																
<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>		<table border="1"> <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>137</td><td>69</td></tr> <tr><td>160</td><td>157</td><td>79</td></tr> <tr><td>170</td><td>179</td><td>90</td></tr> <tr><td>180</td><td>201</td><td>102</td></tr> <tr><td>200</td><td>251</td><td>129</td></tr> <tr><td>220</td><td>307</td><td>158</td></tr> <tr><td>240</td><td>368</td><td>191</td></tr> <tr><td>264</td><td>449</td><td>234</td></tr> <tr><td>280</td><td>507</td><td>265</td></tr> </tbody> </table>	Input Voltage [V]	Hold-Up Time [mS]		Load 50%	Load 100%	150	137	69	160	157	79	170	179	90	180	201	102	200	251	129	220	307	158	240	368	191	264	449	234	280	507	265
Input Voltage [V]	Hold-Up Time [mS]																																	
	Load 50%	Load 100%																																
150	137	69																																
160	157	79																																
170	179	90																																
180	201	102																																
200	251	129																																
220	307	158																																
240	368	191																																
264	449	234																																
280	507	265																																

# COSEL

Model		VAF512		Temperature Testing Circuitry	25℃ Figure A																																																			
Item		Instantaneous Interruption Compensation 瞬時停電保障																																																						
Object		+12.0V0.45A																																																						
1. Graph				2. Values																																																				
<div><div><div>—△—</div><div>—□—</div><div>—○—</div></div><div><div>Input Volt. 170 V</div><div>Input Volt. 200 V</div><div>Input Volt. 264 V</div></div></div> <div><div><div>[mS]</div><div>1000</div><div>100</div><div>10</div><div>1</div></div><div><div>Instantaneous Compensation Time</div><div>0.1</div><div>0.2</div><div>0.3</div><div>0.4</div><div>0.5</div><div>0.6</div></div><div><div>Load Current</div><div>[A]</div></div></div> <div><div>This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.</div><div>Note:Slanted line shows the range of the rated load current.</div></div> <div><div>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。</div><div>(注)斜線は定格負荷電流範囲を示す。</div></div>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Time [mS]</th></tr><tr><th>Input Volt. 170[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 264[V]</th></tr><tr><td>0.000</td><td>—</td><td>—</td><td>—</td></tr><tr><td>0.080</td><td>419</td><td>602</td><td>1073</td></tr><tr><td>0.160</td><td>226</td><td>319</td><td>569</td></tr><tr><td>0.240</td><td>143</td><td>202</td><td>393</td></tr><tr><td>0.320</td><td>118</td><td>152</td><td>293</td></tr><tr><td>0.400</td><td>94</td><td>140</td><td>243</td></tr><tr><td>0.450</td><td>85</td><td>119</td><td>218</td></tr><tr><td>0.495</td><td>77</td><td>110</td><td>202</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. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]	0.000	—	—	—	0.080	419	602	1073	0.160	226	319	569	0.240	143	202	393	0.320	118	152	293	0.400	94	140	243	0.450	85	119	218	0.495	77	110	202	—	—	—	—	—	—	—	—	—	—	—	—
Load Current [A]	Time [mS]																																																							
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]																																																					
0.000	—	—	—																																																					
0.080	419	602	1073																																																					
0.160	226	319	569																																																					
0.240	143	202	393																																																					
0.320	118	152	293																																																					
0.400	94	140	243																																																					
0.450	85	119	218																																																					
0.495	77	110	202																																																					
—	—	—	—																																																					
—	—	—	—																																																					
—	—	—	—																																																					

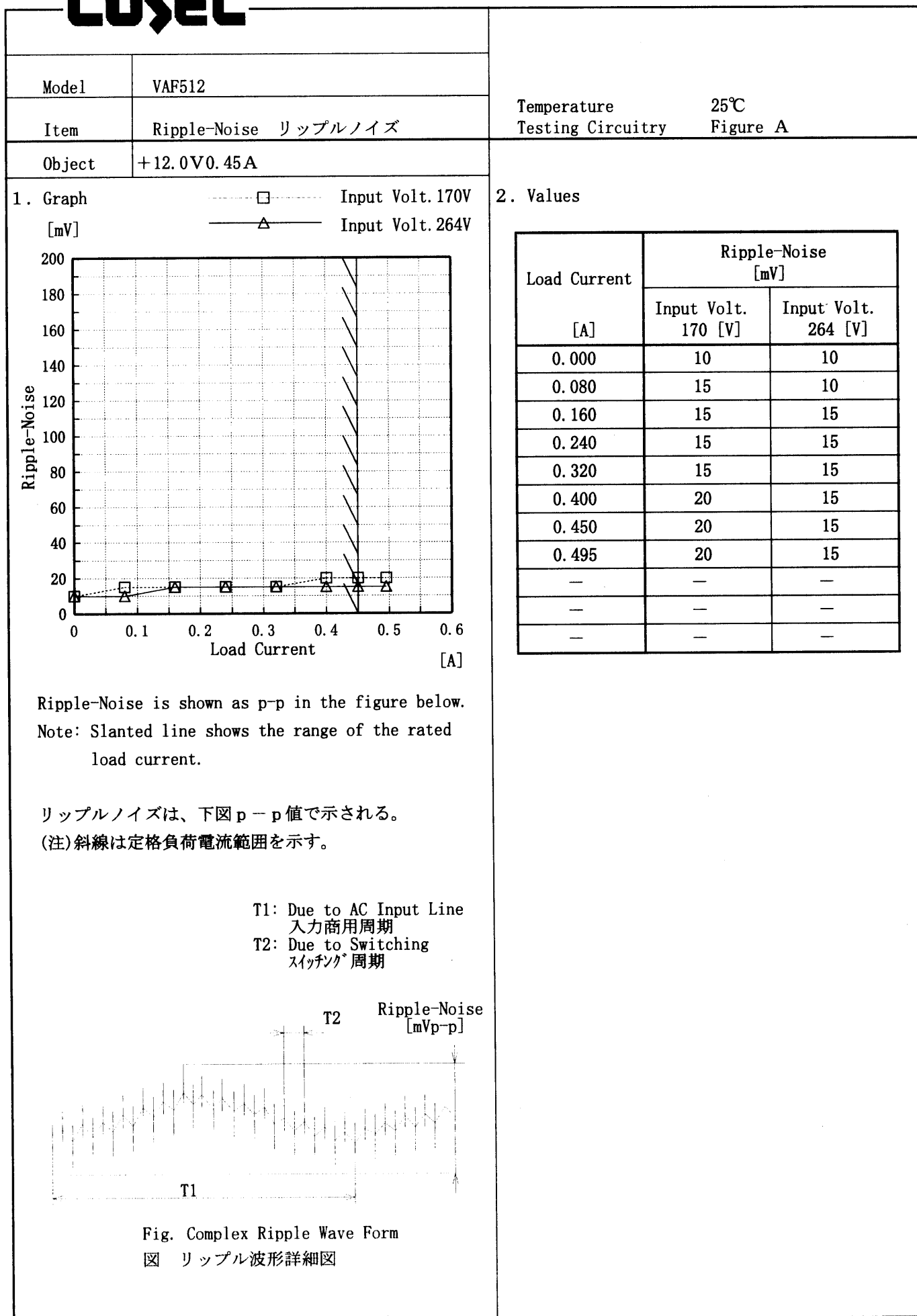
**COSEL**

Model		VAF512		Temperature		25℃																																																				
Item		Load Regulation 静的負荷変動		Testing Circuitry		Figure A																																																				
Object		+12.0V0.45A																																																								
1. Graph				2. Values																																																						
<div><div><div>△</div><div>□</div><div>○</div></div><div><div>Input Volt. 170 V</div><div>Input Volt. 200 V</div><div>Input Volt. 264 V</div></div></div> <div><div><div><div>Output Voltage</div><div>[V]</div></div><div><div>12.26</div><div>12.22</div><div>12.18</div><div>12.14</div><div>12.10</div><div>12.06</div><div>12.02</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</div><div>[A]</div></div></div><div><div>Note: Slanted line shows the range of the rated load current.</div><div><div>(注)斜線は定格負荷電流範囲を示す。</div></div></div></div>				<table><tr><th rowspan="2">Load Current</th><th colspan="3">Output Voltage</th></tr><tr><th>Input Volt.</th><th>Input Volt.</th><th>Input Volt.</th></tr><tr><th>[A]</th><th>170[V]</th><th>200[V]</th><th>264[V]</th></tr><tr><td>0.000</td><td>12.124</td><td>12.124</td><td>12.125</td></tr><tr><td>0.080</td><td>12.124</td><td>12.124</td><td>12.124</td></tr><tr><td>0.160</td><td>12.124</td><td>12.124</td><td>12.124</td></tr><tr><td>0.240</td><td>12.123</td><td>12.123</td><td>12.123</td></tr><tr><td>0.320</td><td>12.123</td><td>12.123</td><td>12.123</td></tr><tr><td>0.400</td><td>12.123</td><td>12.123</td><td>12.123</td></tr><tr><td>0.450</td><td>12.123</td><td>12.123</td><td>12.123</td></tr><tr><td>0.495</td><td>12.123</td><td>12.123</td><td>12.123</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	Output Voltage			Input Volt.	Input Volt.	Input Volt.	[A]	170[V]	200[V]	264[V]	0.000	12.124	12.124	12.125	0.080	12.124	12.124	12.124	0.160	12.124	12.124	12.124	0.240	12.123	12.123	12.123	0.320	12.123	12.123	12.123	0.400	12.123	12.123	12.123	0.450	12.123	12.123	12.123	0.495	12.123	12.123	12.123	—	—	—	—	—	—	—	—
Load Current	Output Voltage																																																									
	Input Volt.	Input Volt.	Input Volt.																																																							
[A]	170[V]	200[V]	264[V]																																																							
0.000	12.124	12.124	12.125																																																							
0.080	12.124	12.124	12.124																																																							
0.160	12.124	12.124	12.124																																																							
0.240	12.123	12.123	12.123																																																							
0.320	12.123	12.123	12.123																																																							
0.400	12.123	12.123	12.123																																																							
0.450	12.123	12.123	12.123																																																							
0.495	12.123	12.123	12.123																																																							
—	—	—	—																																																							
—	—	—	—																																																							

# COSEL

Model	VAF512	Temperature	25℃																																						
Item	Ripple Voltage (by Load Current) リップル電圧 (負荷電流特性)	Testing Circuitry	Figure A																																						
Object	+12.0V 0.45A																																								
1. Graph		2. Values																																							
<div><div>-----□----- Input Volt. 170V</div><div>-----△----- Input Volt. 264V</div><p>Ripple Voltage is shown as p-p in the figure below.</p><p>Note: Slanted line shows the range of the rated load current.</p><p>リップル電圧は、下図 p-p 値で示される。</p><p>(注) 斜線は定格負荷電流範囲を示す。</p></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 170 [V]</th><th>Input Volt. 264 [V]</th></tr><tr><td>0.000</td><td>5</td><td>5</td></tr><tr><td>0.080</td><td>10</td><td>10</td></tr><tr><td>0.160</td><td>10</td><td>10</td></tr><tr><td>0.240</td><td>15</td><td>10</td></tr><tr><td>0.320</td><td>15</td><td>10</td></tr><tr><td>0.400</td><td>15</td><td>10</td></tr><tr><td>0.450</td><td>15</td><td>10</td></tr><tr><td>0.495</td><td>15</td><td>10</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. 170 [V]	Input Volt. 264 [V]	0.000	5	5	0.080	10	10	0.160	10	10	0.240	15	10	0.320	15	10	0.400	15	10	0.450	15	10	0.495	15	10	—	—	—	—	—	—	—	—	—
Load Current [A]	Ripple Voltage [mV]																																								
	Input Volt. 170 [V]	Input Volt. 264 [V]																																							
0.000	5	5																																							
0.080	10	10																																							
0.160	10	10																																							
0.240	15	10																																							
0.320	15	10																																							
0.400	15	10																																							
0.450	15	10																																							
0.495	15	10																																							
—	—	—																																							
—	—	—																																							
—	—	—																																							
<div><div>T1: Due to AC Input Line 入力商用周期</div><div>T2: Due to Switching スイッチング周期</div><p>Fig. Complex Ripple Wave Form</p><p>図 リップル波形詳細図</p></div>																																									

# COSEL



# COSEL

Model		VAF512	Temperature25℃ Testing CircuitryFigure A
Item		Overcurrent Protection 過電流保護	
Object		+12.0V0.45A	

1. Graph

[V]

20.0

15.0

10.0

5.0

0.0

0

0.5

1

1.5

2

2.5

3

Output Voltage

Load Current

[A]

.....

Input Volt.170 V

————

Input Volt.200 V

————

Input Volt.264 V

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。

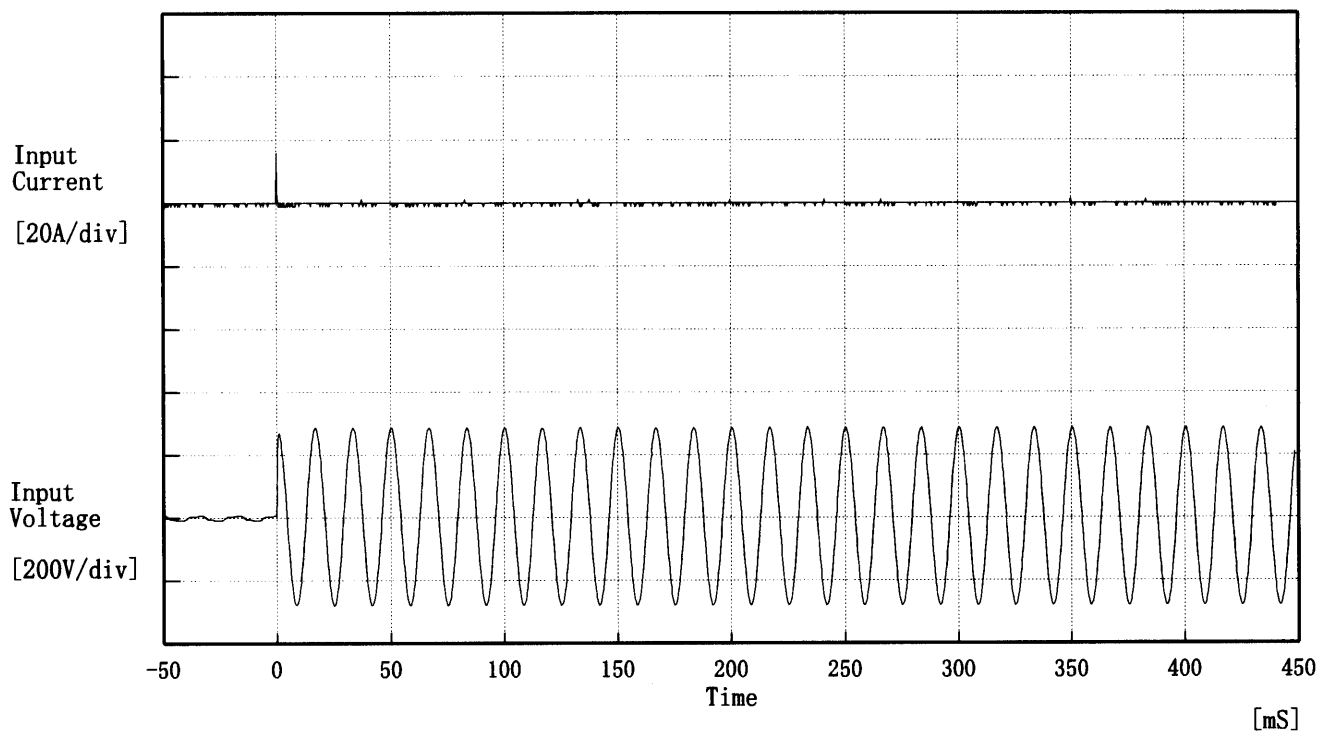
(注2)垂下部分は間欠モード時のピーク電流を示す。

2. Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
12.00	1.41	1.44	1.62
11.40	1.46	1.48	1.63
10.80	1.48	1.54	1.67
9.60	1.57	1.62	1.75
8.40	1.66	1.72	1.85
7.20	1.79	1.82	1.94
6.00	1.88	1.88	2.06
4.80	2.00	2.06	2.16
3.60	2.13	2.19	2.28
2.40	2.27	2.32	2.40
1.20	—	—	—
0.00	—	—	—

**COSEL**

Model	VAF512	Temperature 25°C Testing Circuitry Figure A
Item	Inrush Current 突入電流	
Object		



Input Voltage 200 V

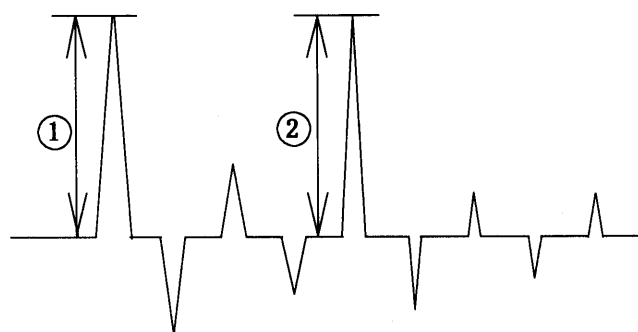
Frequency 60 Hz

Load 100 %

Inrush Current

① 15.71 [A]

② 1.13 [A]





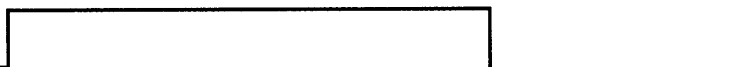
# COSEL

Model	VAF512	Temperature 25°C Testing Circuitry Figure A
Item	Dynamic Load Responce 動的負荷変動	
Object	+12.0V0.45A	

Input Volt. 200 V

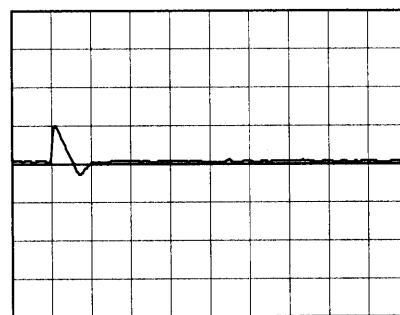
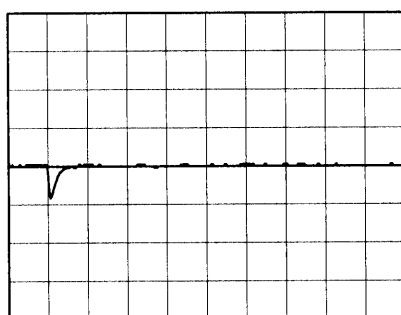
Cycle 1000 mS

Load Current



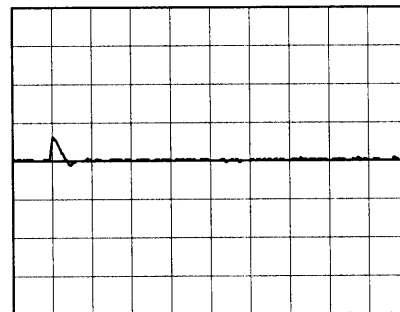
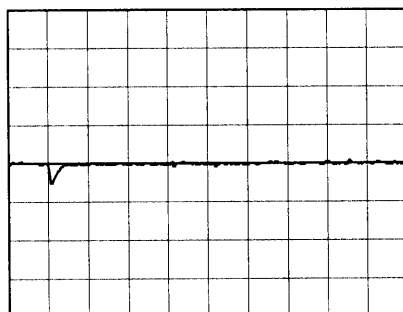
Min. Load  $\longleftrightarrow$

Load 100 %



Min. Load  $\longleftrightarrow$

Load 50 %



100 mV/div

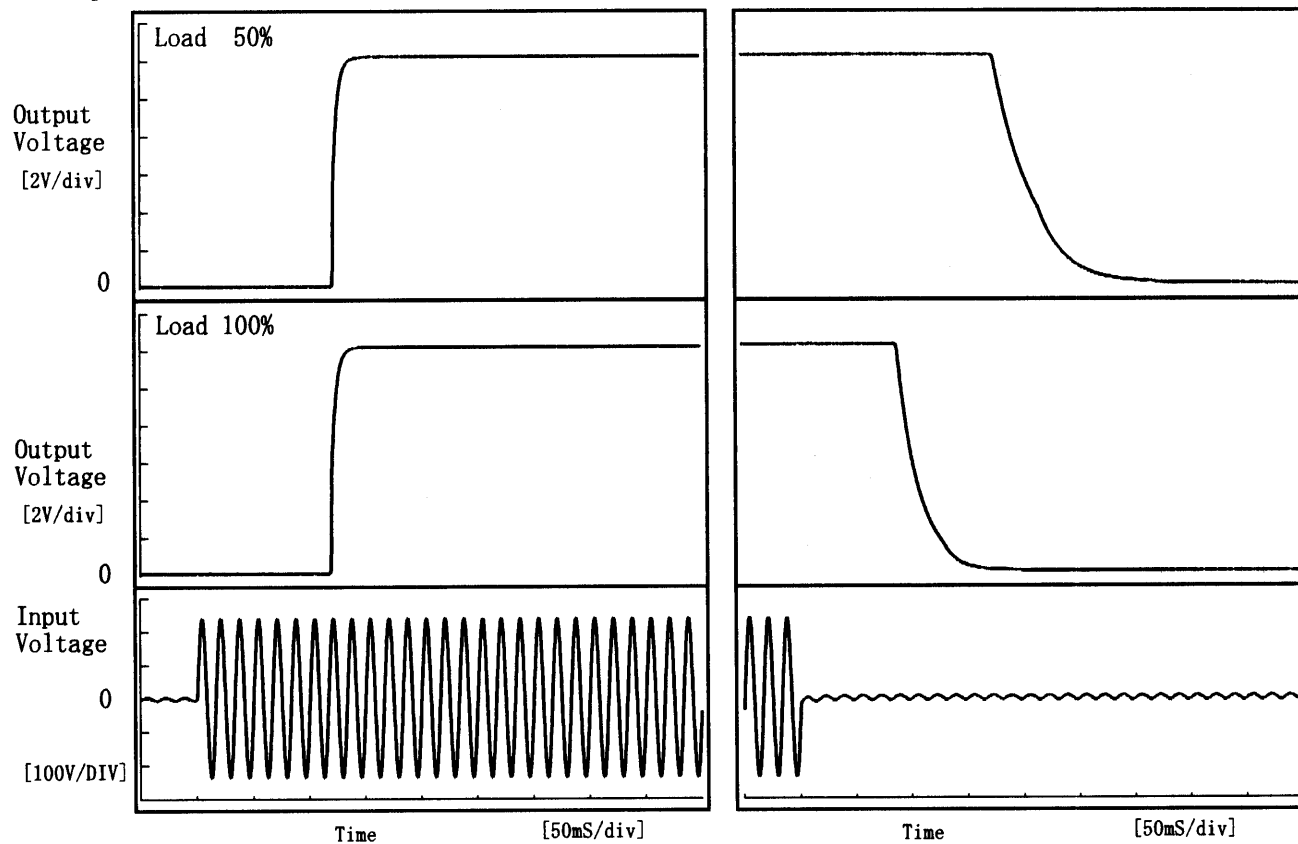
20 mS/div

**COSEL**

Model	VAF512	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	+12.0V0.45A		

## 1. Graph

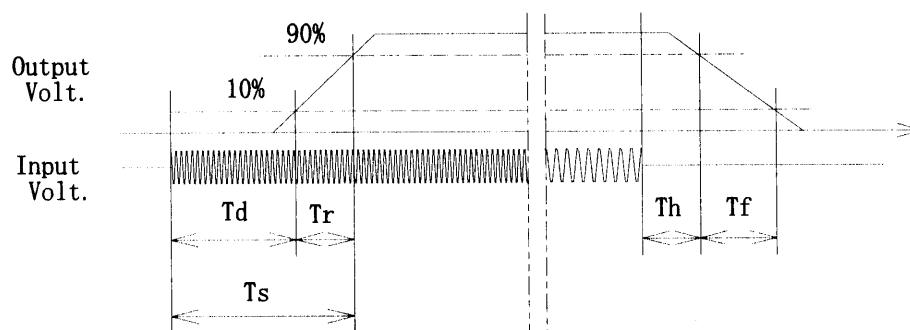
Input Volt. 170 V



## 2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	120.8	7.5	128.3	178.3	70.0
100 %	119.5	7.5	127.0	90.5	43.3



# COSEL

Model		VAF512
Item		Ambient Temperature Drift 周囲温度変動
Object		+12.0V0.45A

1. Graph

△

Input Volt. 170V

□

Input Volt. 200V

○

Input Volt. 264V

Output Voltage

[V]

12.25

12.21

12.17

12.13

12.09

12.05

12.01

0

12.095

12.099

12.103

12.107

12.112

12.121

12.124

12.127

12.128

12.127

Ambient Temperature

[°C]

-30

-10

10

30

50

70

Load 100%

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。

2. Values

Temperature [°C]	Output Voltage [V]		
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
-30	12.095	12.095	12.095
-20	12.099	12.099	12.099
-10	12.103	12.103	12.103
0	12.107	12.107	12.107
10	12.112	12.112	12.113
25	12.121	12.121	12.121
30	12.124	12.124	12.124
40	12.127	12.127	12.127
55	12.128	12.128	12.129
60	12.127	12.127	12.127
—	—	—	—

# COSEL

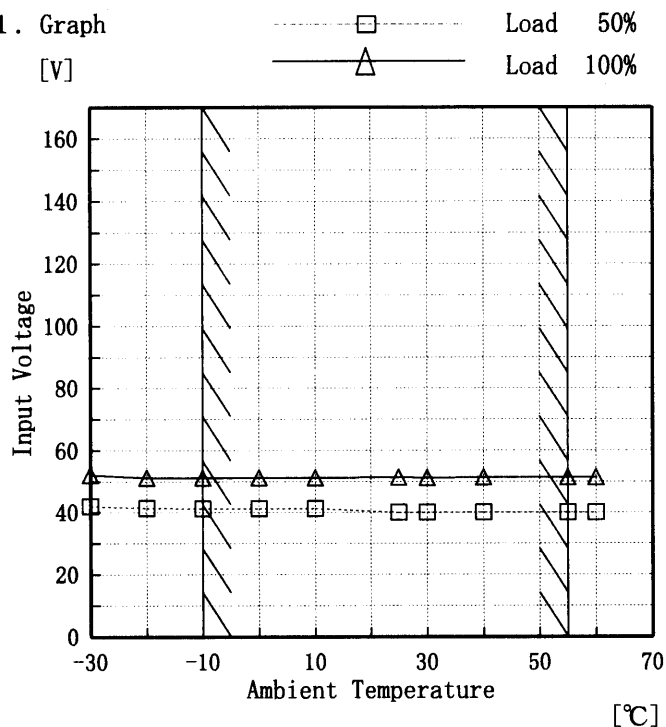
Model VAF512

Item Minimum Input Voltage for Regulated Output Voltage  
最低レギュレーション電圧

Object +12.0V0.45A

Testing Circuitry Figure A

## 1. Graph



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。

## 2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-30	42	52
-20	41	51
-10	41	51
0	41	51
10	41	51
25	40	51
30	40	51
40	40	51
55	40	51
60	40	51
—	—	—

# COSEL

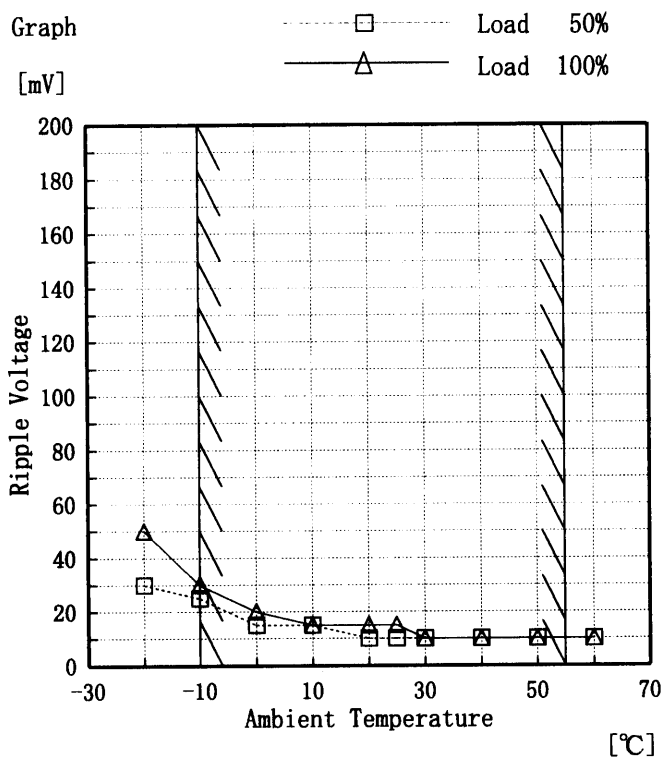
Model VAF512

Item Ripple Voltage (by Ambient Temp.)  
リップル電圧 (周囲温度特性)

Object +12.0V0.45A

Testing Circuitry Figure A

## 1. Graph



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。

## 2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-20	30	50
-10	25	30
0	15	20
10	15	15
20	10	15
25	10	15
30	10	10
40	10	10
50	10	10
60	10	10
—	—	—

**COSEL**

Model

VAF512

Item

Time Lapse Drift 経時ドリフト

Object

+12.0V0.45A

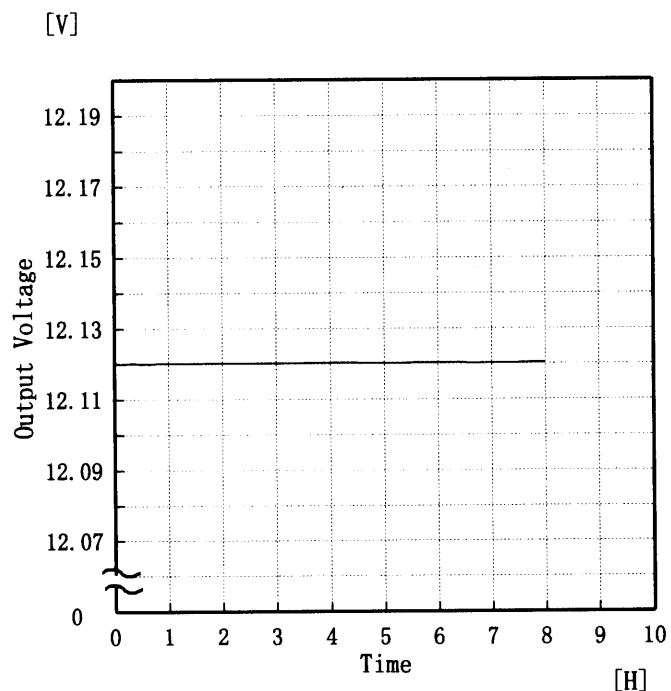
Temperature

25 °C

Testing Circuitry

Figure A

## 1. Graph



## 2. Values

Time since start [H]	Output Voltage [V]
0.0	12.120
0.5	12.120
1.0	12.120
2.0	12.120
3.0	12.120
4.0	12.120
5.0	12.120
6.0	12.120
7.0	12.120
8.0	12.120

**COSEL**

Model	VAF512	Testing Circuitry Figure A
Item	Output Voltage Accuracy 定電圧精度	
Object	+12.0V0.45A	

## 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 : 0.00~0.45A

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

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

## 定電圧精度

周囲温度、入力電圧、負荷を下記仕様内で、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 0.00~0.45A

\* 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) =  $\frac{\text{変動値}}{\text{定格出力電圧}} \times 100$

Item	Temperature [°C]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy(Ration) [%]
Maximum Voltage	55	200	0.00	12.129	±13	±0.2
Minimum Voltage	-10	170	0.45	12.103		

# COSEL

Model		VAF512	
Item		Oscillator Frequency 発振周波数	
Object		+12.0V0.45A	
1. Graph		2. Values	



# COSEL

COSEL

		Testing Circuitry      Figure A
Model	VAF512	
Item	Condensation    結露特性	
Object	+12.0V0.45A	

1. Condensation test

Testing procedure is as follows.

① Keeping and cooling the unit in a tank at -10℃ for an hour with the input off.

② Taking it out of the tank and dewing itself in a room where the temperature is 25℃ and the humidity is 40%RH.

③ Testing electrical characteristics of the unit to confirm there be no fault.

1. 結露特性試験

入力を切った状態で、恒温槽で－10℃に冷却しておき、約1時間後に恒温槽から取り出し、室温25℃、湿度40%RHの状態におき結露させ、その電気的特性の測定を行い、異常のないことを確認する。

2. Values

Item	Data	Testing Conditions
Output Voltage [V]	12.031	Input Volt. : 200V, Load Current:0.45A
Line Regulation [mV]	1	Input Volt. : 170～264V, Load Current:0.45A
Load Regulation [mV]	3	Input Volt. : 200V, Load Current:0.00～0.45A

**COSEL**

LUCEL

Model	VAF512		
Item	Leakage Current 漏洩電流		
Object			

1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A) DENTORI	—	—	—
(B) IEC60950	—	—	—

Standards	Leakage Current [mA]		
	Input Volt. 170 [V]	Input Volt. 230 [V]	Input Volt. 264 [V]
(B) IEC60950	0.16	0.22	0.25

2. Condition

Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

交流入力 の両相について測定し、その大きい方を漏洩電流測定値とする。

Temperature25℃

Testing CircuitryFigure B

— 24 —

BC-3233

**COSEL**

Model	VAF512		
Item	Line Noise Tolerance 入力雑音耐量	Temperature Testing Circuitry	25℃ Figure C
Object	+12.0V0.45A		

## 1. Results

Pulse Width [ nS ]	MODE	No protection failure should occur 保護回路の誤動作がない	DC-like Regulation of Output Voltage 出力電圧の直流的変動
50	COMMON	OK	no fluctuation
	NORMAL	OK	no fluctuation
1000	COMMON	OK	no fluctuation
	NORMAL	OK	no fluctuation

## 2. Conditions

Input Voltage : 200 V  
 Pulse Voltage : 2000 V  
 Pulse Cycle : 10 mS  
 Pulse Input Duration : 1 min. or more  
 Load : 100 %

**COSEL**

Model	VAF512	Temperature	25°C
Item	Conducted Emission 雑音端子電圧	Testing Circuitry	Figure D
Object	_____		

## 1. Graph

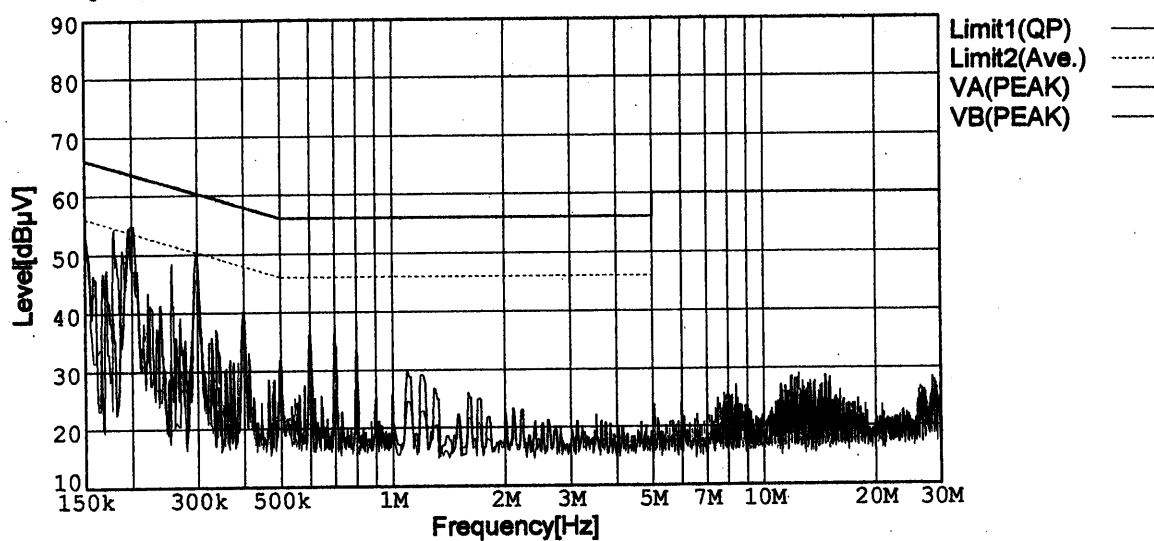
## Remarks

Input Volt. 230 V (CISPR Pub22 Class B)

Load 100 %

Limit1: [CISPR Pub22] Class B(QP)

Limit2: [CISPR Pub22] Class B(Ave.)



**COSEL**

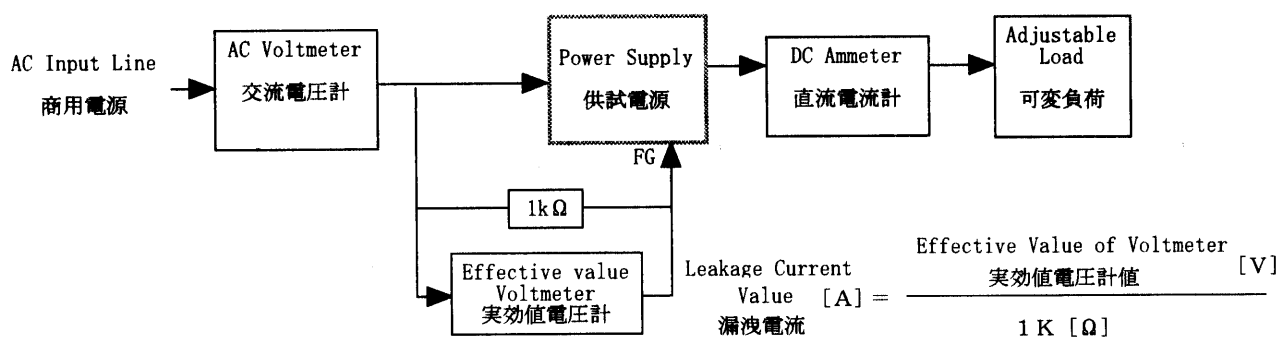
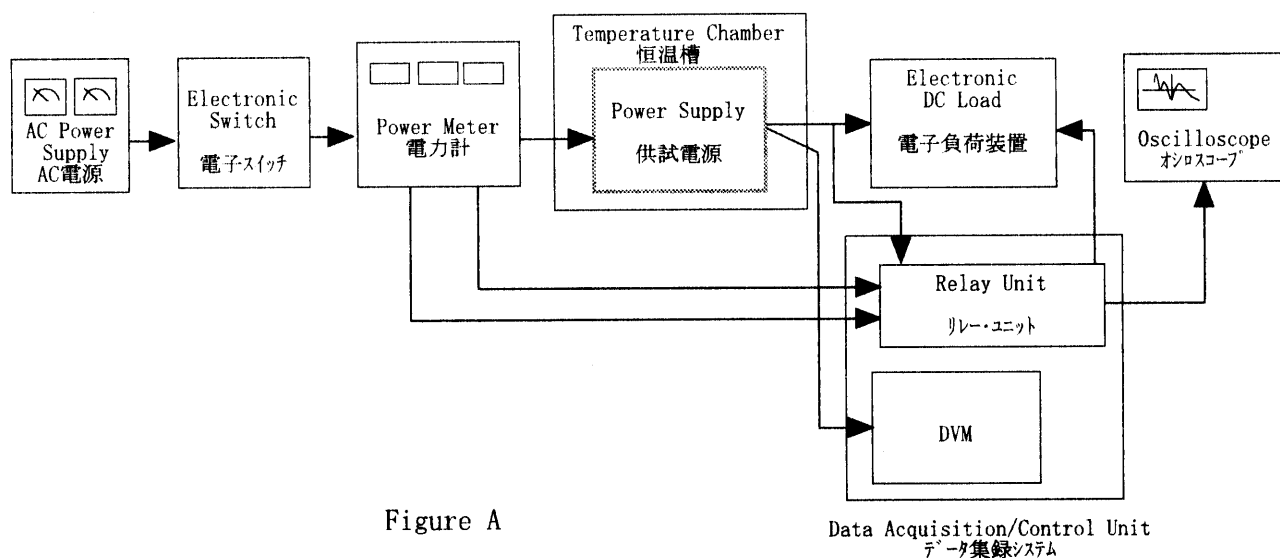


Figure B (DENTORI)

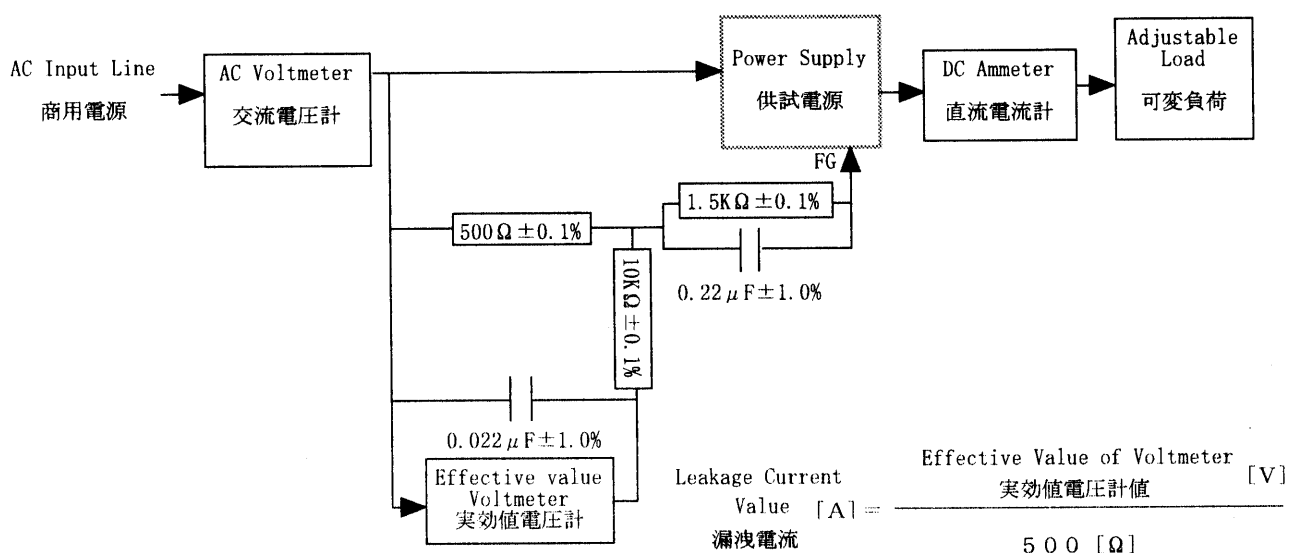


Figure B ( I E C 6 0 9 5 0 )

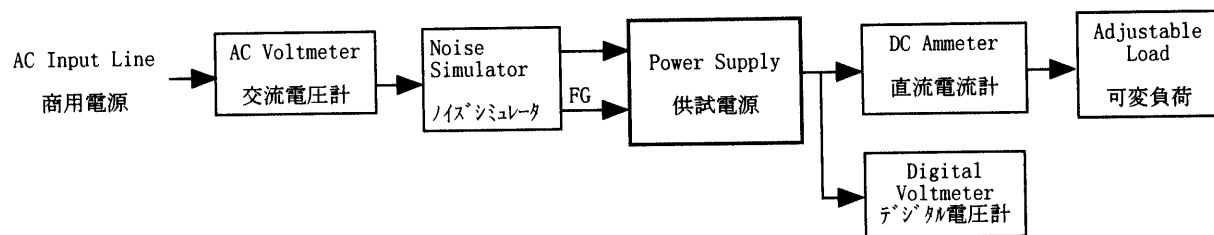


Figure C

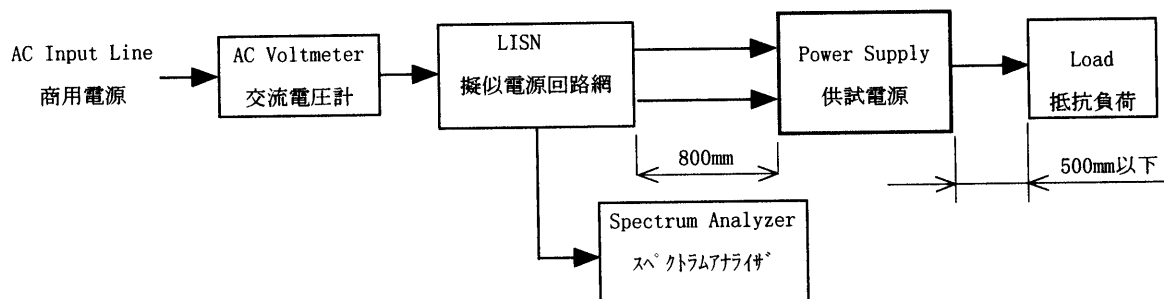


Figure D

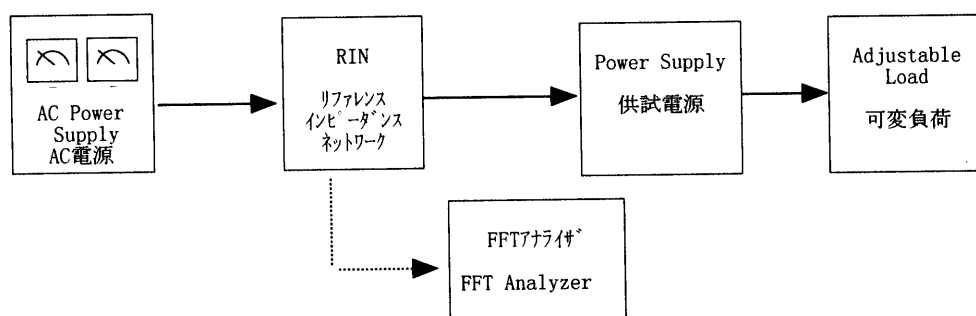


Figure E