



TEST DATA OF R10A-24
(100V INPUT)

Regulated DC Power Supply

Date : Apr. 28. 1999

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Design Manager

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Design Engineer

コーセル株式会社
COSEL CO., LTD.



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Model		R10A-24		Temperature		25°C																																	
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Model		R10A-24		Temperature		25°C																																	
Item		Hold-Up Time 出力保持時間		Testing Circuitry		Figure A																																	
Object		+24V0.5A																																					
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Input Voltage [V]	Load 50%	Load 100%																																					
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Model		R10A-24		Temperature		25°C																																																				
Item		Instantaneous Interruption Compensation 瞬時停電保障		Testing Circuitry		Figure A																																																				
Object		+24V0.5A																																																								
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<p>—△— Input Volt. 85 V - - □ - - Input Volt. 100 V - - ○ - - Input Volt. 132 V</p> <p>Instantaneous Compensation Time [mS]</p> <p>Load Current [A]</p>				<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th>Input Volt. 85[V]</th> <th>Input Volt. 100[V]</th> <th>Input Volt. 132[V]</th> </tr> <tr> <th colspan="3">Time [mS]</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>0.08</td><td>104</td><td>141</td><td>232</td></tr> <tr><td>0.16</td><td>56</td><td>79</td><td>137</td></tr> <tr><td>0.24</td><td>39</td><td>56</td><td>102</td></tr> <tr><td>0.32</td><td>27</td><td>40</td><td>76</td></tr> <tr><td>0.40</td><td>20</td><td>31</td><td>61</td></tr> <tr><td>0.48</td><td>12</td><td>22</td><td>47</td></tr> <tr><td>0.50</td><td>11</td><td>20</td><td>44</td></tr> <tr><td>0.55</td><td>6</td><td>14</td><td>38</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>				Load Current [A]	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	Time [mS]			0.00	—	—	—	0.08	104	141	232	0.16	56	79	137	0.24	39	56	102	0.32	27	40	76	0.40	20	31	61	0.48	12	22	47	0.50	11	20	44	0.55	6	14	38	—	—	—	—	—	—	—	—
Load Current [A]	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																																							
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Model		R10A-24	Temperature		25°C																																															
Item		Load Regulation 静的負荷変動	Testing Circuitry		Figure A																																															
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Model		R10A-24	Temperature		25°C																																						
Item		Ripple Voltage (by Load Current) リップル電圧(負荷電流特性)	Testing Circuitry		Figure A																																						
Object		+24V0.5A	2. Values																																								
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Load Current [A]	Input Volt. 85 [V]	Input Volt. 132 [V]																																									
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<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> <p>T1: Due to AC Input Line 入力商用周期</p> <p>T2: Due to Switching スイッチング周期</p>		<p>Fig. Complex Ripple Wave Form</p> <p>図 リップル波形詳細図</p>																																									



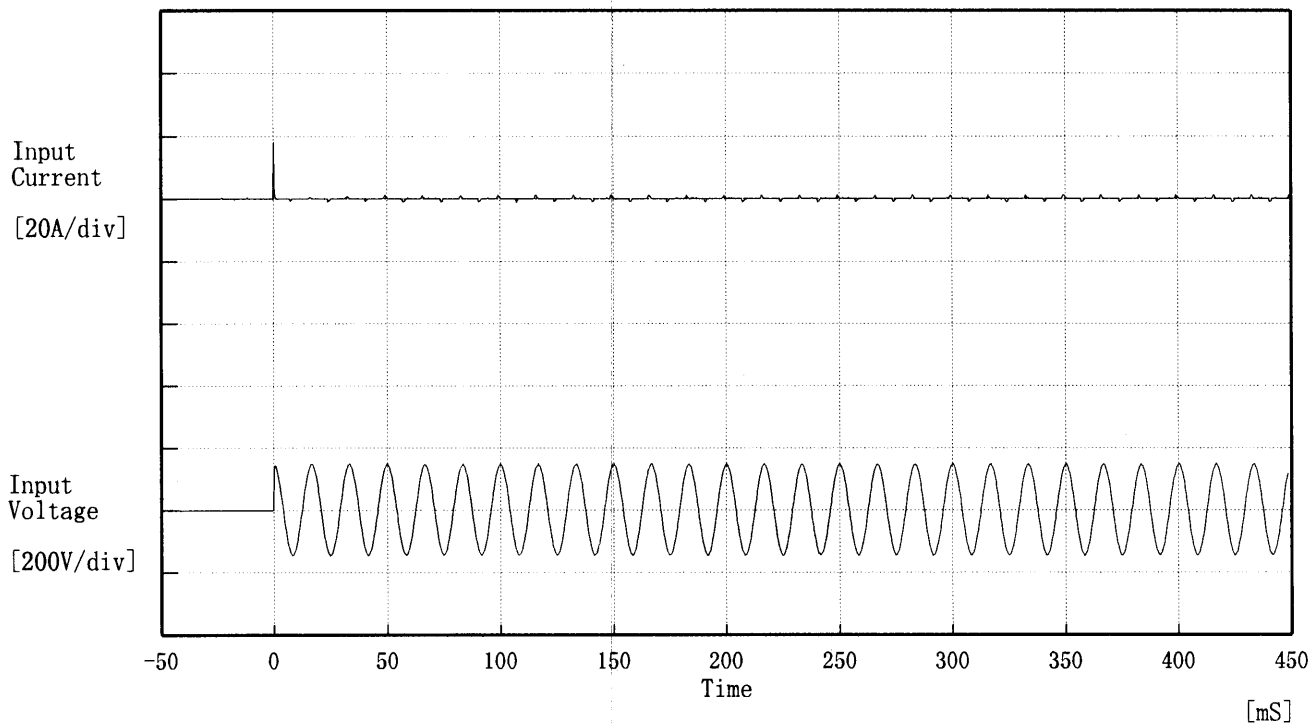
Model		R10A-24	Temperature		25°C																																						
Item		Ripple-Noise リップルノイズ	Testing Circuitry		Figure A																																						
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<p>1. Graph</p> <p>[mV]</p> <p>-----□----- Input Volt. 85V</p> <p>-----△----- Input Volt. 132V</p> <p>Ripple-Noise is shown as p-p in the figure below. Note: Slanted line shows the range of the rated load current.</p> <p>リップルノイズは、下図 p-p 値で示される。 (注)斜線は定格負荷電流範囲を示す。</p> <p>T1: Due to AC Input Line 入力商用周期 T2: Due to Switching スイッチング周期</p> <p>Fig. Complex Ripple Wave Form 図 リップル波形詳細図</p>			<p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Load current [A]</th> <th>Input Volt. 85 [V]</th> <th>Input Volt. 132 [V]</th> </tr> <tr> <th>Ripple-Noise [mV]</th> <th>Ripple-Noise [mV]</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>10</td><td>10</td></tr> <tr><td>0.08</td><td>10</td><td>10</td></tr> <tr><td>0.16</td><td>10</td><td>10</td></tr> <tr><td>0.24</td><td>15</td><td>10</td></tr> <tr><td>0.32</td><td>20</td><td>15</td></tr> <tr><td>0.40</td><td>20</td><td>15</td></tr> <tr><td>0.48</td><td>20</td><td>15</td></tr> <tr><td>0.50</td><td>20</td><td>15</td></tr> <tr><td>0.55</td><td>35</td><td>15</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>			Load current [A]	Input Volt. 85 [V]	Input Volt. 132 [V]	Ripple-Noise [mV]	Ripple-Noise [mV]	0.00	10	10	0.08	10	10	0.16	10	10	0.24	15	10	0.32	20	15	0.40	20	15	0.48	20	15	0.50	20	15	0.55	35	15	—	—	—	—	—	—
Load current [A]	Input Volt. 85 [V]	Input Volt. 132 [V]																																									
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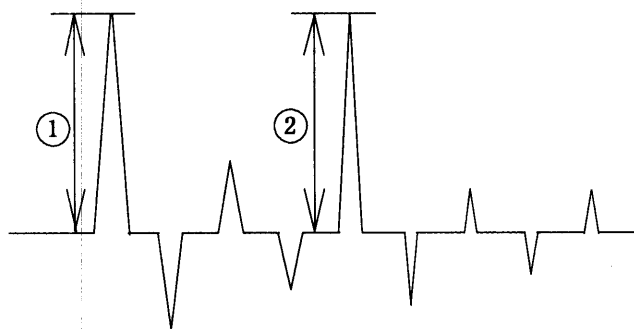
Model		R10A-24	Temperature		25°C																																																				
Item		Overcurrent Protection 過電流保護	Testing Circuitry		Figure A																																																				
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Output Voltage [V]	Input Volt. 85[V] Load Current [A]	Input Volt. 100[V] Load Current [A]	Input Volt. 132[V] Load Current [A]																																																						
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COSEL

Model	R10A-24	Temperature 25°C Testing Circuitry Figure A
Item	Inrush Current 突入電流	
Object	_____	



Input Voltage 100 V
 Frequency 60 Hz
 Load 100 %
 Inrush Current
 ① 18.00 [A]
 ② 1.20 [A]

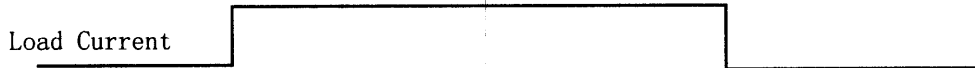




Model		R10A-24	Temperature		25°C
Item		Dynamic Load Responce 動的負荷変動	Testing Circuitry		Figure A
Object		+24V0.5A			

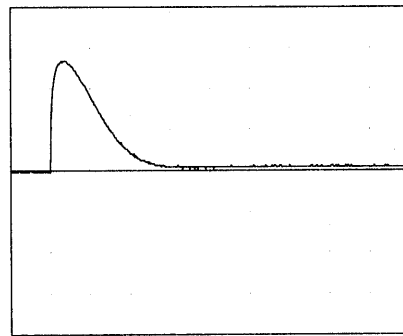
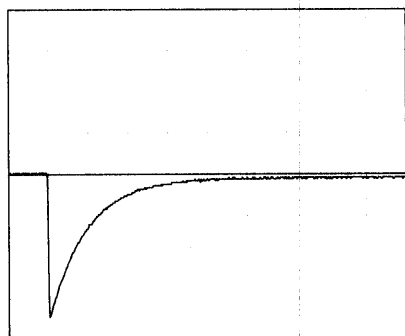
Input Volt. 100 V

Cycle 1000 mS



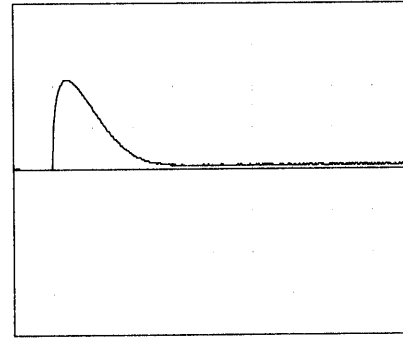
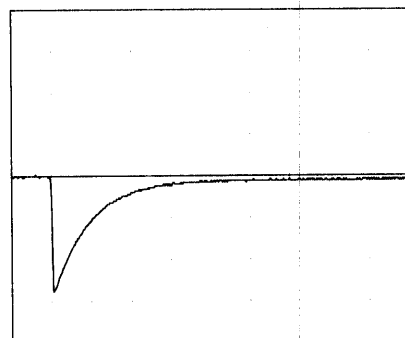
Min. Load ↔

Load 100 %



Min. Load ↔

Load 50 %



100 mV/div

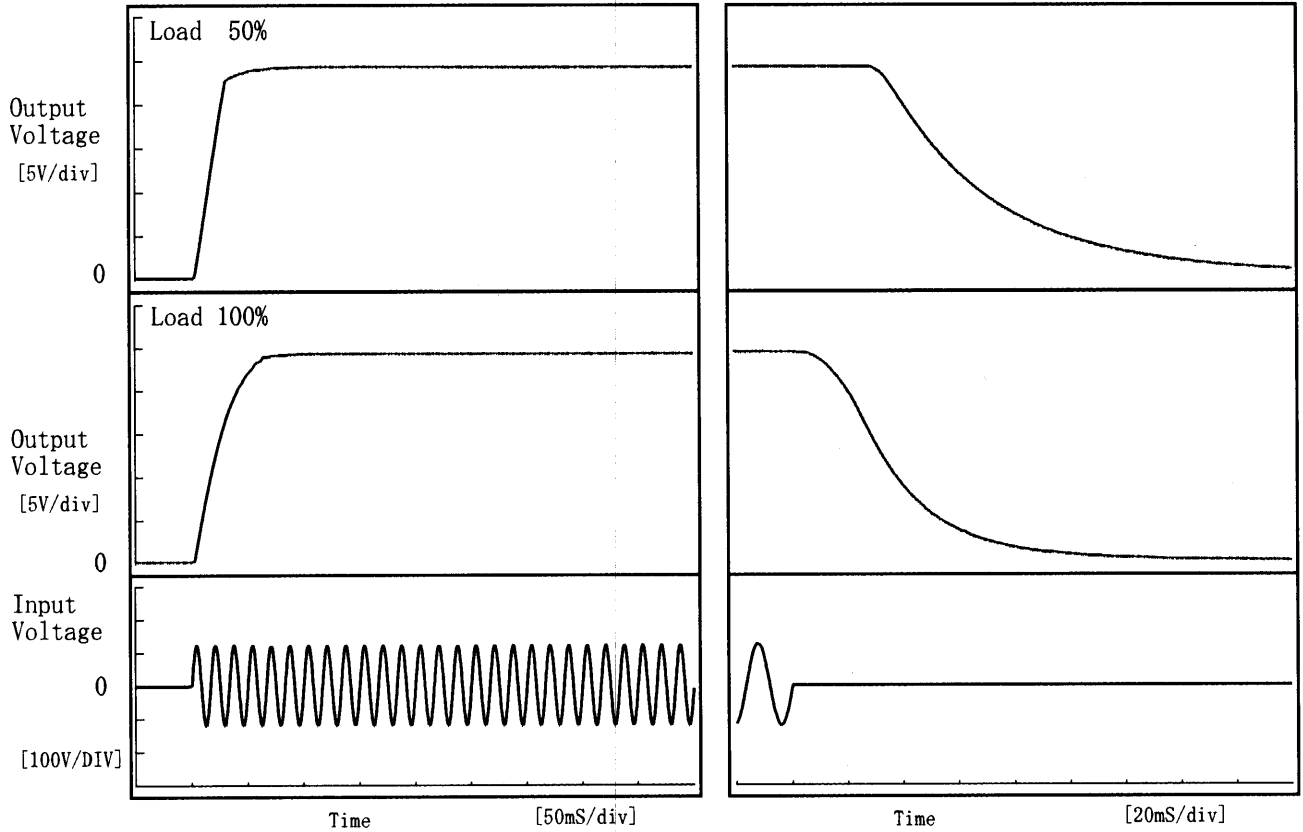
20 ms/div



Model	R10A-24	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	+24V0.5A		

1. Graph

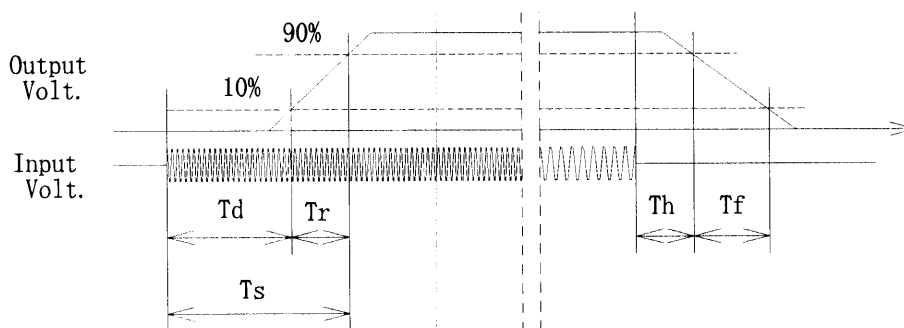
Input Volt. 85 V



2. Values

[mS]

Load \ Time	T d	T r	T s	T h	T f
50 %	5.5	24.0	29.5	37.1	93.3
100 %	5.8	43.5	49.3	16.2	54.6





Model		R10A-24																																																			
Item		Ambient Temperature Drift 周囲温度変動		Testing Circuitry Figure A																																																	
Object		+24V0.5A																																																			
1. Graph		<p> <input type="checkbox"/>△—— Input Volt. 85V <input type="checkbox"/>□----- Input Volt. 100V <input type="checkbox"/>○----- Input Volt. 132V </p>		2. Values																																																	
<p>[V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p>				<table border="1"> <thead> <tr> <th>Temperature [°C]</th> <th>Input Volt. 85[V] Output Volt. [V]</th> <th>Input Volt. 100[V] Output Volt. [V]</th> <th>Input Volt. 132[V] Output Volt. [V]</th> </tr> </thead> <tbody> <tr><td>-20</td><td>24.158</td><td>24.159</td><td>24.159</td></tr> <tr><td>-10</td><td>24.158</td><td>24.159</td><td>24.158</td></tr> <tr><td>0</td><td>24.159</td><td>24.159</td><td>24.159</td></tr> <tr><td>10</td><td>24.158</td><td>24.159</td><td>24.158</td></tr> <tr><td>20</td><td>24.158</td><td>24.158</td><td>24.158</td></tr> <tr><td>25</td><td>24.157</td><td>24.157</td><td>24.157</td></tr> <tr><td>30</td><td>24.159</td><td>24.159</td><td>24.158</td></tr> <tr><td>40</td><td>24.150</td><td>24.150</td><td>24.150</td></tr> <tr><td>50</td><td>24.138</td><td>24.138</td><td>24.138</td></tr> <tr><td>60</td><td>24.124</td><td>24.124</td><td>24.123</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>		Temperature [°C]	Input Volt. 85[V] Output Volt. [V]	Input Volt. 100[V] Output Volt. [V]	Input Volt. 132[V] Output Volt. [V]	-20	24.158	24.159	24.159	-10	24.158	24.159	24.158	0	24.159	24.159	24.159	10	24.158	24.159	24.158	20	24.158	24.158	24.158	25	24.157	24.157	24.157	30	24.159	24.159	24.158	40	24.150	24.150	24.150	50	24.138	24.138	24.138	60	24.124	24.124	24.123	—	—	—	—
Temperature [°C]	Input Volt. 85[V] Output Volt. [V]	Input Volt. 100[V] Output Volt. [V]	Input Volt. 132[V] Output Volt. [V]																																																		
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<p>Note: Slanted line shows the range of the rated ambient temperature.</p> <p>(注)斜線は定格周囲温度範囲を示す。</p>																																																					



Model		R10A-24		Testing Circuitry Figure A																																					
Item		Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧																																							
Object		+24V0.5A																																							
1. Graph		-----□----- Load 50% -----△----- Load 100%		2. Values																																					
[V] 100 80 60 40 20 0 Input Voltage				<table border="1"> <thead> <tr> <th>Ambient Temp. [°C]</th> <th>Load 50% Input Volt. [V]</th> <th>Load 100% Input Volt. [V]</th> </tr> </thead> <tbody> <tr><td>-20</td><td>37</td><td>66</td></tr> <tr><td>-10</td><td>37</td><td>67</td></tr> <tr><td>0</td><td>37</td><td>67</td></tr> <tr><td>10</td><td>36</td><td>67</td></tr> <tr><td>20</td><td>36</td><td>68</td></tr> <tr><td>25</td><td>36</td><td>68</td></tr> <tr><td>30</td><td>36</td><td>67</td></tr> <tr><td>40</td><td>36</td><td>68</td></tr> <tr><td>50</td><td>37</td><td>68</td></tr> <tr><td>60</td><td>37</td><td>68</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>		Ambient Temp. [°C]	Load 50% Input Volt. [V]	Load 100% Input Volt. [V]	-20	37	66	-10	37	67	0	37	67	10	36	67	20	36	68	25	36	68	30	36	67	40	36	68	50	37	68	60	37	68	—	—	—
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-30 -10 10 30 50 70 Ambient Temperature [°C]		Note: Slanted line shows the range of the rated ambient temperature.																																							
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Model		R10A-24	Testing Circuitry Figure A																																					
Item		Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)																																						
Object		+24V0.5A																																						
1. Graph		<p>-----□----- Load 50%</p> <p>-----△----- Load 100%</p> <p>Input Volt. 85 V</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p> <p>(注)斜線は定格周囲温度範囲を示す。</p>	2. Values																																					
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Ambient Temp. [°C]	Load 50% Ripple Output Volt. [mV]	Load 100% Ripple Output Volt. [mV]																																						
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—	—	—																																						



COSEL																								
Model	R10A-24																							
Item	Time Lapse Drift 経時ドリフト	Temperature 25 °C Testing Circuitry Figure A																						
Object	+24V0.5A																							
<p>1. Graph</p> <p>[V]</p> <p style="text-align: center;">Time [H]</p> <p>Input Volt. 100V Load 100%</p>		<p>2. Values</p> <table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>24.157</td></tr> <tr><td>0.5</td><td>24.150</td></tr> <tr><td>1.0</td><td>24.150</td></tr> <tr><td>2.0</td><td>24.150</td></tr> <tr><td>3.0</td><td>24.150</td></tr> <tr><td>4.0</td><td>24.150</td></tr> <tr><td>5.0</td><td>24.150</td></tr> <tr><td>6.0</td><td>24.151</td></tr> <tr><td>7.0</td><td>24.151</td></tr> <tr><td>8.0</td><td>24.151</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	24.157	0.5	24.150	1.0	24.150	2.0	24.150	3.0	24.150	4.0	24.150	5.0	24.150	6.0	24.151	7.0	24.151	8.0	24.151
Time since start [H]	Output Voltage [V]																							
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Model		R10A-24	Testing Circuitry Figure A
Item		Output Voltage Accuracy 定電圧精度	
Object		+24V0.5A	

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 : -10~50 °C
- Input Voltage : 85~132 V
- Load Current : 0.00~0.5 A

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

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

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 -10~50 °C
- 入力電圧 85~132 V
- 負荷電流 0.00~0.5 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) = $\frac{\text{変動値}}{\text{定格出力電圧}} \times 100$

Item	Temperature [°C]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy(Ration) [%]
Maximum Voltage	-10	132	0.00	24.168	±16	±0.1
Minimum Voltage	50	85	0.50	24.138		



Model		R10A-24	Temperature		25°C																																																			
Item		Oscillator Frequency 発振周波数	Testing Circuitry		Figure A																																																			
Object		+24V0.5A																																																						
1. Graph			2. Values																																																					
<p> <input type="checkbox"/> —△— Input Volt. 85 V <input type="checkbox"/> - - - □ - - - Input Volt. 100 V <input type="checkbox"/> - - - ○ - - - Input Volt. 132 V </p> <p> 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。 </p>			<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th>Input Volt. 85[V]</th> <th>Input Volt. 100[V]</th> <th>Input Volt. 132[V]</th> </tr> <tr> <th colspan="3">Oscillator Frequency [KHz]</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>430</td><td>462</td><td>465</td></tr> <tr><td>0.08</td><td>262</td><td>292</td><td>318</td></tr> <tr><td>0.16</td><td>187</td><td>200</td><td>231</td></tr> <tr><td>0.24</td><td>148</td><td>165</td><td>187</td></tr> <tr><td>0.32</td><td>121</td><td>135</td><td>155</td></tr> <tr><td>0.40</td><td>100</td><td>113</td><td>130</td></tr> <tr><td>0.48</td><td>89</td><td>97</td><td>114</td></tr> <tr><td>0.50</td><td>84</td><td>95</td><td>110</td></tr> <tr><td>0.55</td><td>78</td><td>88</td><td>103</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>			Load Current [A]	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	Oscillator Frequency [KHz]			0.00	430	462	465	0.08	262	292	318	0.16	187	200	231	0.24	148	165	187	0.32	121	135	155	0.40	100	113	130	0.48	89	97	114	0.50	84	95	110	0.55	78	88	103	—	—	—	—	—	—	—	—
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—	—	—	—																																																					
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COSEL

Model		R10A-24	Testing Circuitry Figure A												
Item		Condensation 結露特性													
Object		+24V0.5A													
<p>1. Condensation test</p> <p>Testing procedure is as follows.</p> <p>① Keeping and cooling the unit in a tank at -10°C for an hour with the input off.</p> <p>② Taking it out of the tank and dewing itself in a room where the temperature is 25°C and the humidity is 40%RH.</p> <p>③ Testing electrical characteristics of the unit to confirm there be no fault.</p> <p>1. 結露特性試験</p> <p>入力を切った状態で、恒温槽で-10°C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°C、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。</p>															
2. Values															
<table border="1"> <thead> <tr> <th>Item</th> <th>Data</th> <th>Testing Conditions</th> </tr> </thead> <tbody> <tr> <td>Output Voltage [V]</td> <td>24.161</td> <td>Input Volt.: 100V, Load Current:0.5A</td> </tr> <tr> <td>Line Regulation [mV]</td> <td>1</td> <td>Input Volt.: 85~100V, Load Current:0.5A</td> </tr> <tr> <td>Load Regulation [mV]</td> <td>8</td> <td>Input Volt.: 100V, Load Current:0.0~0.5A</td> </tr> </tbody> </table>				Item	Data	Testing Conditions	Output Voltage [V]	24.161	Input Volt.: 100V, Load Current:0.5A	Line Regulation [mV]	1	Input Volt.: 85~100V, Load Current:0.5A	Load Regulation [mV]	8	Input Volt.: 100V, Load Current:0.0~0.5A
Item	Data	Testing Conditions													
Output Voltage [V]	24.161	Input Volt.: 100V, Load Current:0.5A													
Line Regulation [mV]	1	Input Volt.: 85~100V, Load Current:0.5A													
Load Regulation [mV]	8	Input Volt.: 100V, Load Current:0.0~0.5A													



Model		R10A-24	Temperature		25°C
Item		Leakage Current 漏洩電流	Testing Circuitry		Figure B
Object		_____			

1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A) DENTORI	0.08	0.09	0.12
(B) IEC60950	0.08	0.09	0.12

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

2. Condition

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

交流入力 of 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。



Model		R10A-24	Temperature		25°C
Item		Line Noise Tolerance 入力雑音耐量	Testing Circuitry		Figure C
Object		+24V0.5A			

1. Results

Pulse Width [n S]	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

Conditions

Input Voltage : 100 V
 Pulse Voltage : 1000 V
 Pulse Cycle : 10 mS
 Pulse Input Duration: 1 min. or more
 Load : 100 %



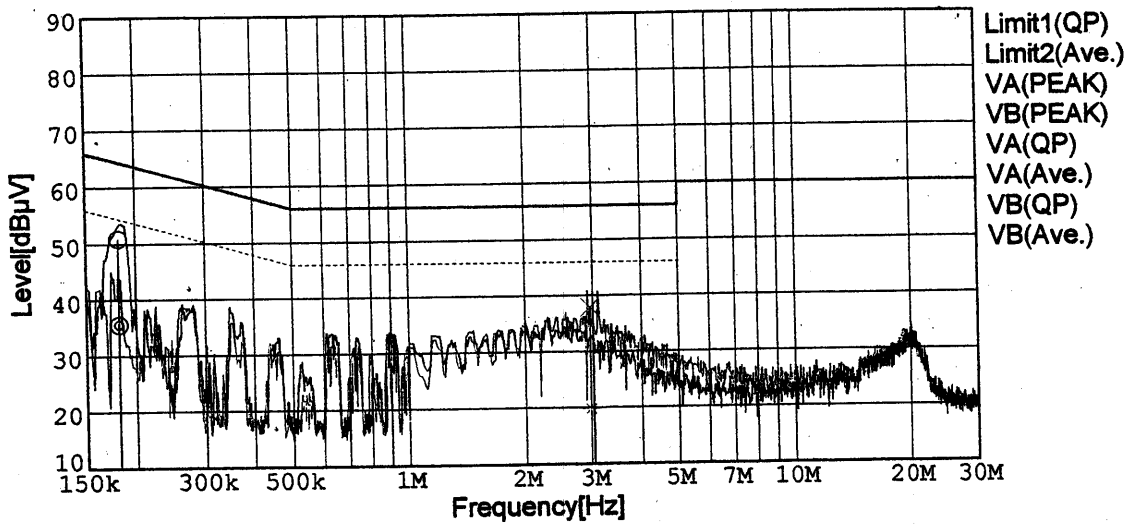
Model	R10A-24	Temperature	25°C
Item	Conducted Emission 雑音端子電圧	Testing Circuitry	Figure D
Object	_____		

1. Graph

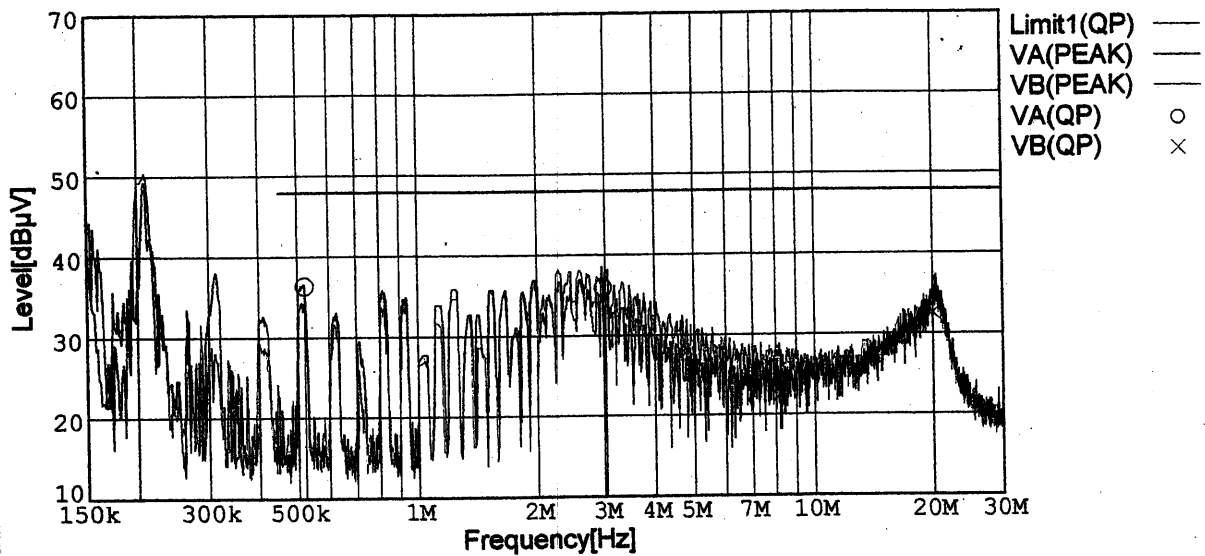
Remarks

Input Volt. 100V (VCCI Class B)
 120V (FCC Class B)
 Load 100 %

Limit1: [VCCI] Class B(QP)
 Limit2: [VCCI] Class B(Ave.)



Limit1: [FCC Part15] Class B



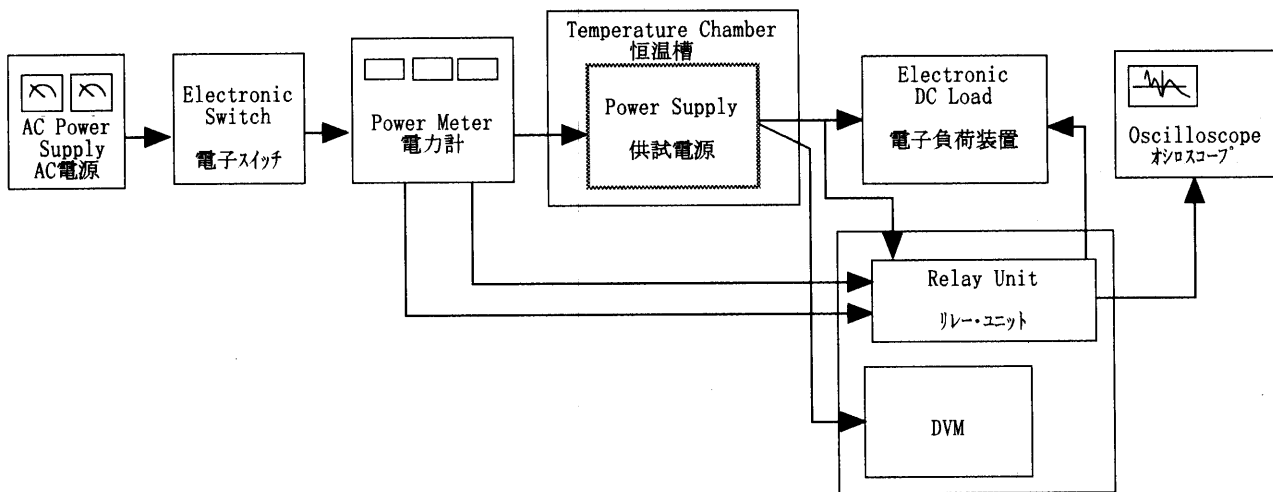


Figure A

Data Acquisition/Control Unit
データ集録システム

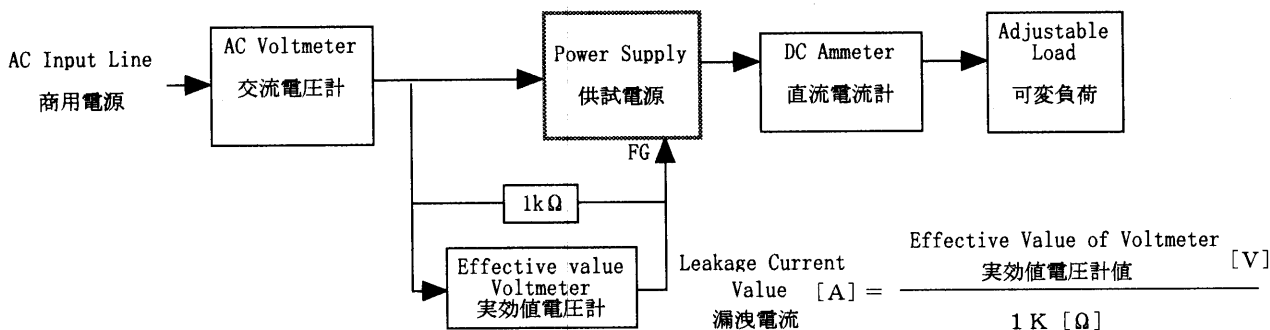


Figure B (DENTORI)

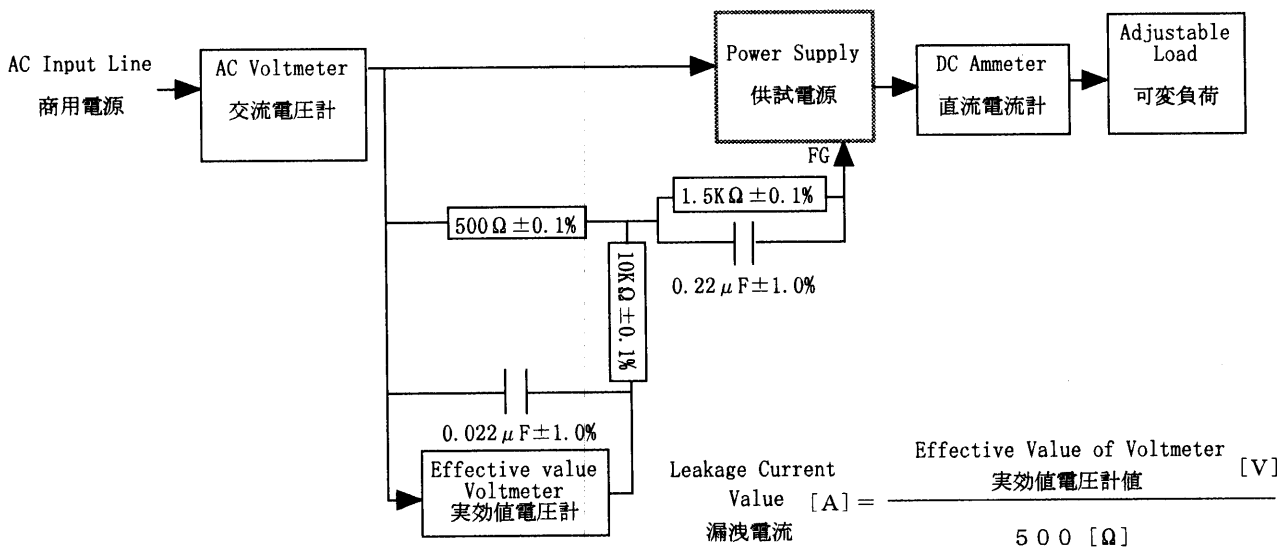


Figure B (IEC60950)

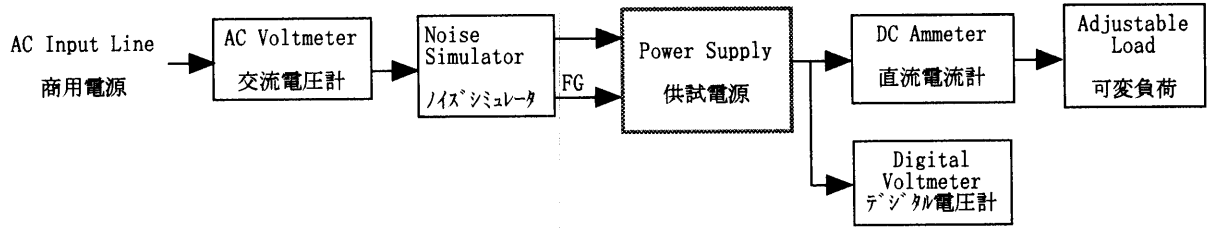


Figure C

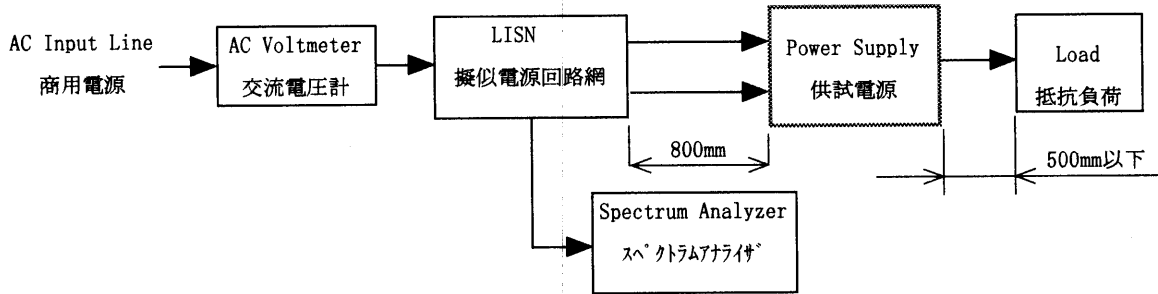


Figure D

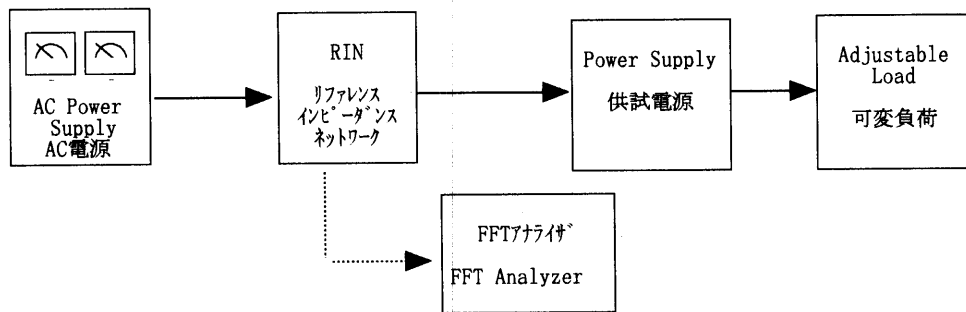


Figure E