



TEST DATA OF R150-9

Regulated DC Power Supply
Mar 14, 2005

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COSEL CO.,LTD.



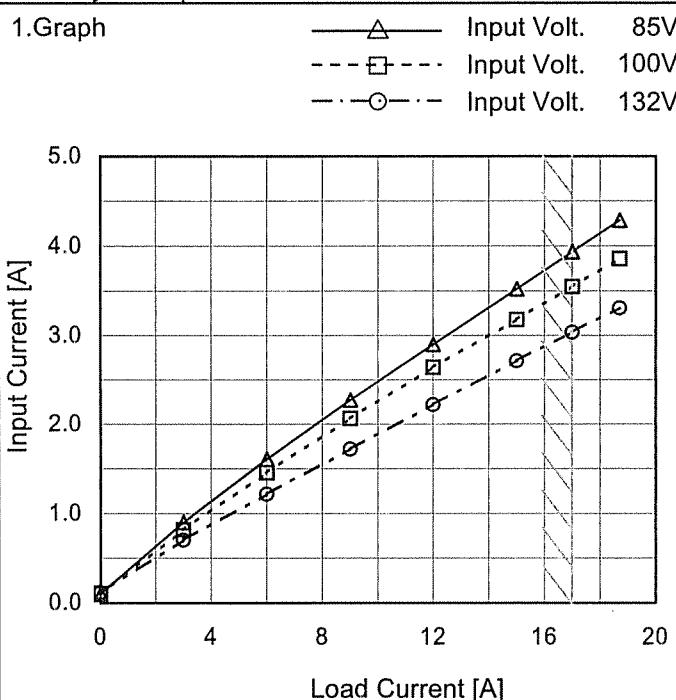
CONTENTS

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

(Final Page 21)

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Model	R150-9
Item	Input Current (by Load Current)
Object	_____



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

 Temperature 25°C
 Testing Circuitry Figure A

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	0.101	0.105	0.115
3.0	0.900	0.820	0.704
6.0	1.608	1.460	1.216
9.0	2.274	2.064	1.722
12.0	2.900	2.640	2.220
15.0	3.525	3.180	2.712
17.0	3.940	3.549	3.036
18.7	4.290	3.862	3.308
--	-	-	-
--	-	-	-
--	-	-	-

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Model	R150-9	Temperature Testing Circuitry 25°C Figure A																																															
Item	Input Power (by Load Current)																																																
Object	_____																																																
1.Graph	<p>Input Power [W]</p> <p>Load Current [A]</p> <p>Legend:</p> <ul style="list-style-type: none"> Input Volt. 85V Input Volt. 100V Input Volt. 132V <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Input Power [W] (85V)</th> <th>Input Power [W] (100V)</th> <th>Input Power [W] (132V)</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>3.1</td><td>3.6</td><td>4.9</td></tr> <tr><td>3.0</td><td>35.0</td><td>35.8</td><td>38.1</td></tr> <tr><td>6.0</td><td>66.0</td><td>66.0</td><td>68.4</td></tr> <tr><td>9.0</td><td>97.5</td><td>97.8</td><td>99.3</td></tr> <tr><td>12.0</td><td>130.2</td><td>129.9</td><td>130.5</td></tr> <tr><td>15.0</td><td>163.5</td><td>162.6</td><td>162.6</td></tr> <tr><td>17.0</td><td>187.0</td><td>184.8</td><td>184.4</td></tr> <tr><td>18.7</td><td>207.0</td><td>204.3</td><td>203.1</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> </tbody> </table>	Load Current [A]	Input Power [W] (85V)	Input Power [W] (100V)	Input Power [W] (132V)	0.0	3.1	3.6	4.9	3.0	35.0	35.8	38.1	6.0	66.0	66.0	68.4	9.0	97.5	97.8	99.3	12.0	130.2	129.9	130.5	15.0	163.5	162.6	162.6	17.0	187.0	184.8	184.4	18.7	207.0	204.3	203.1	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Input Power [W] (85V)	Input Power [W] (100V)	Input Power [W] (132V)																																														
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2.Values																																																	

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

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Model	R150-9	Temperature	25°C																																
Item	Efficiency (by Input Voltage)	Testing Circuitry	Figure A																																
Object	_____																																		
1.Graph																																			
<p>The graph plots Efficiency [%] on the y-axis (58 to 86) against Input Voltage [V] on the x-axis (70 to 150). Two data series are shown: Load 50% (dashed line with open squares) and Load 100% (solid line with open triangles). Both series show efficiency remaining relatively constant around 83% across the input voltage range. A slanted line indicates the rated input voltage range.</p> <table border="1"> <thead> <tr> <th>Input Voltage [V]</th> <th>Efficiency Load 50% [%]</th> <th>Efficiency Load 100% [%]</th> </tr> </thead> <tbody> <tr><td>75</td><td>83.2</td><td>81.2</td></tr> <tr><td>80</td><td>83.4</td><td>81.8</td></tr> <tr><td>85</td><td>83.2</td><td>82.2</td></tr> <tr><td>90</td><td>83.2</td><td>82.5</td></tr> <tr><td>100</td><td>82.9</td><td>82.9</td></tr> <tr><td>110</td><td>83.3</td><td>83.2</td></tr> <tr><td>120</td><td>82.7</td><td>83.2</td></tr> <tr><td>132</td><td>82.2</td><td>83.2</td></tr> <tr><td>140</td><td>81.7</td><td>83.0</td></tr> </tbody> </table>				Input Voltage [V]	Efficiency Load 50% [%]	Efficiency Load 100% [%]	75	83.2	81.2	80	83.4	81.8	85	83.2	82.2	90	83.2	82.5	100	82.9	82.9	110	83.3	83.2	120	82.7	83.2	132	82.2	83.2	140	81.7	83.0		
Input Voltage [V]	Efficiency Load 50% [%]	Efficiency Load 100% [%]																																	
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<p>Note: Slanted line shows the range of the rated input voltage.</p>																																			

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Model	R150-9
Item	Efficiency (by Load Current)
Object	

1.Graph

Load Current [A]	Input Volt. 85V [%]	Input Volt. 100V [%]	Input Volt. 132V [%]
0.0	-	-	-
3.0	77.6	75.9	71.3
6.0	82.2	82.2	79.4
9.0	83.4	83.2	81.9
12.0	83.3	83.5	83.1
15.0	82.8	83.3	83.3
17.0	82.1	83.0	83.2
18.7	81.5	82.6	83.1
--	-	-	-
--	-	-	-
--	-	-	-

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

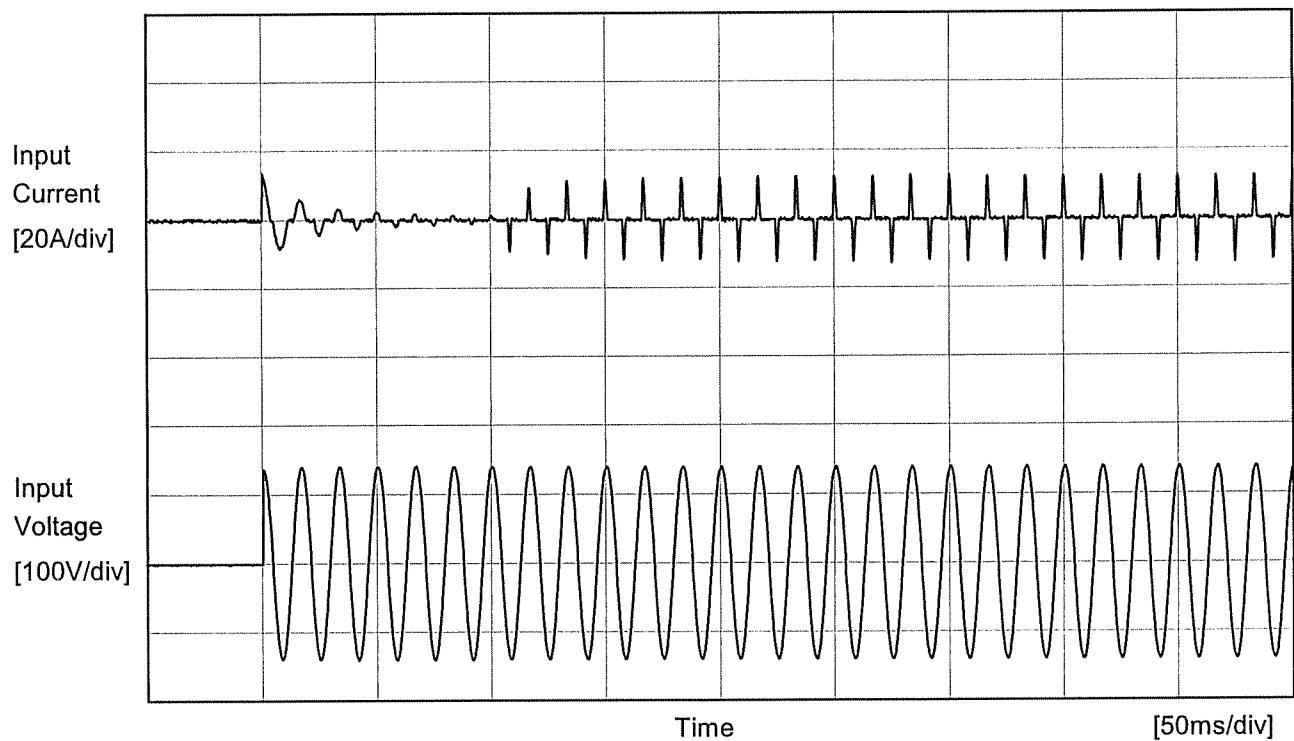
Temperature 25°C
Testing Circuitry Figure A

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	-	-	-
3.0	77.6	75.9	71.3
6.0	82.2	82.2	79.4
9.0	83.4	83.2	81.9
12.0	83.3	83.5	83.1
15.0	82.8	83.3	83.3
17.0	82.1	83.0	83.2
18.7	81.5	82.6	83.1
--	-	-	-
--	-	-	-
--	-	-	-

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Model	R150-9	Temperature Testing Circuitry Figure A
Item	Inrush Current	
Object	_____	



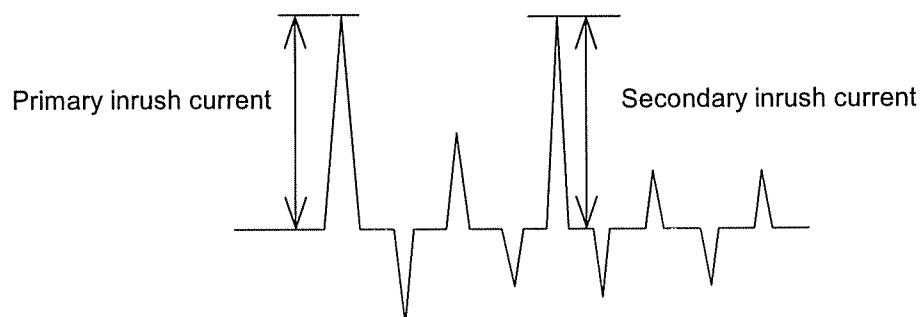
Input Voltage 100 V

Frequency 60 Hz

Load 100 %

Primary inrush current 13.5 A

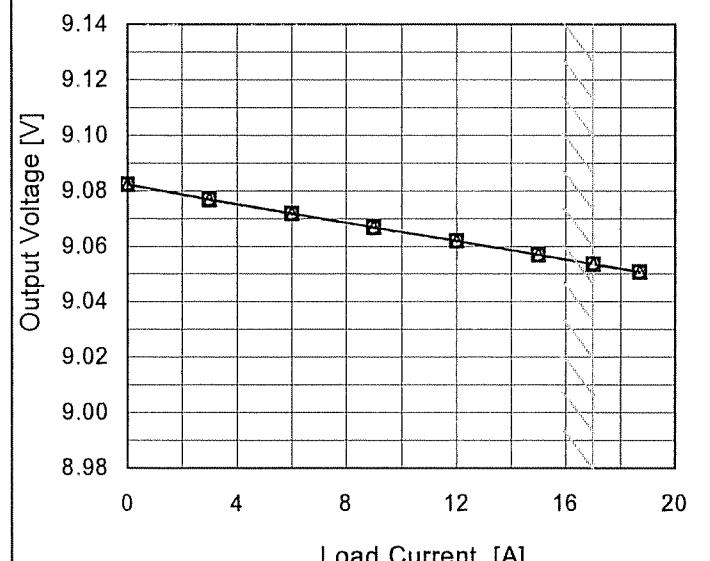
Secondary inrush current 12.9 A



COSEL

Model	R150-9	Temperature	25°C																																
Item	Line Regulation	Testing Circuitry	Figure A																																
Object	+9V17A																																		
1. Graph		2. Values																																	
		<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>75</td><td>9.068</td><td>9.054</td></tr> <tr><td>80</td><td>9.068</td><td>9.054</td></tr> <tr><td>85</td><td>9.068</td><td>9.054</td></tr> <tr><td>90</td><td>9.068</td><td>9.054</td></tr> <tr><td>100</td><td>9.068</td><td>9.054</td></tr> <tr><td>110</td><td>9.068</td><td>9.054</td></tr> <tr><td>120</td><td>9.068</td><td>9.054</td></tr> <tr><td>132</td><td>9.068</td><td>9.054</td></tr> <tr><td>140</td><td>9.068</td><td>9.054</td></tr> </tbody> </table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	75	9.068	9.054	80	9.068	9.054	85	9.068	9.054	90	9.068	9.054	100	9.068	9.054	110	9.068	9.054	120	9.068	9.054	132	9.068	9.054	140	9.068	9.054
Input Voltage [V]	Output Voltage [V]																																		
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<p>Note: Slanted line shows the range of the rated input voltage.</p>																																			

COSEL

Model	R150-9	Temperature	25°C		
Item	Load Regulation	Testing Circuitry	Figure A		
Object	+9V17A				
1. Graph					
—△— Input Volt. 85V - - -□--- Input Volt. 100V - - ○--- Input Volt. 132V					
 <p>The graph plots Output Voltage [V] on the Y-axis (from 8.98 to 9.14) against Load Current [A] on the X-axis (from 0 to 20). Three data series are shown for input voltages of 85V, 100V, and 132V. The 85V curve (triangles) starts at ~9.08V at 0A and drops to ~9.05V at 18A. The 100V curve (squares) starts at ~9.08V at 0A and drops to ~9.05V at 18A. The 132V curve (circles) starts at ~9.08V at 0A and drops to ~9.05V at 18A. A slanted line is drawn through the data points, representing the rated load current range.</p>					
Note: Slanted line shows the range of the rated load current.					

Load Current [A]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	9.082	9.082	9.082
3.0	9.077	9.077	9.077
6.0	9.072	9.072	9.072
9.0	9.067	9.067	9.067
12.0	9.062	9.062	9.062
15.0	9.057	9.057	9.057
17.0	9.054	9.054	9.054
18.7	9.051	9.051	9.051
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	R150-9	Temperature Testing Circuitry Figure A	25°C
Item	Dynamic Load Response		
Object	+9V17A		

Input Volt. 100 V
 Cycle 1000 ms

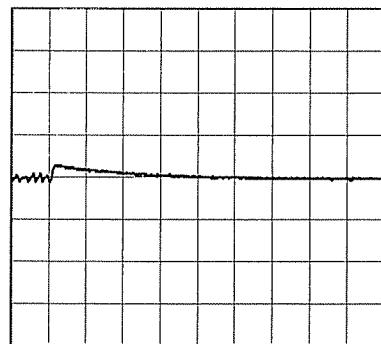


Min. Load (0A) ↔

Load 100% (17A)

200 mV/div

10 ms/div

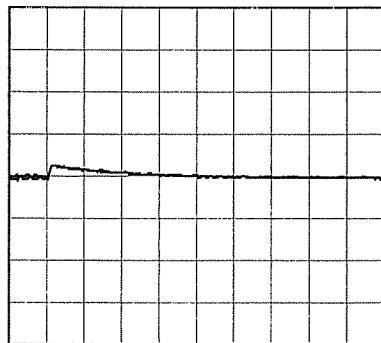


Min. Load (0A) ↔

Load 50% (8.5A)

200 mV/div

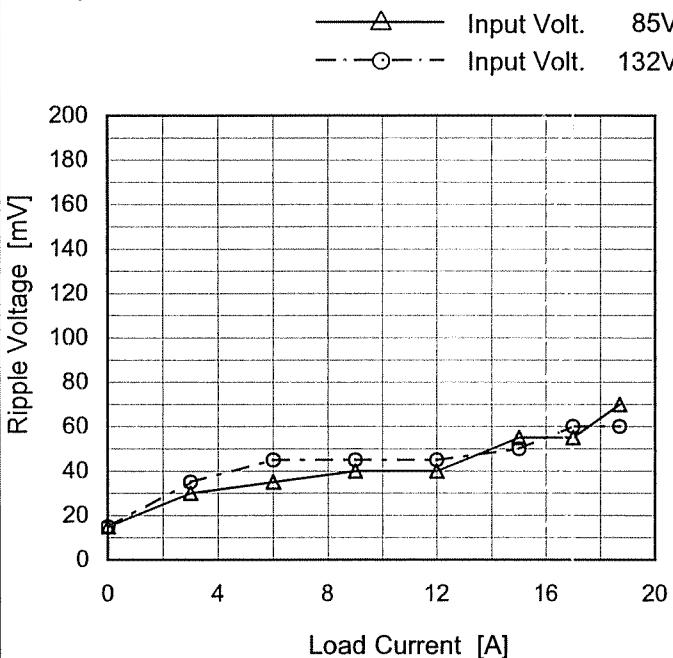
10 ms/div



COSEL

Model	R150-9
Item	Ripple Voltage (by Load Current)
Object	+9V17A

1.Graph



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.

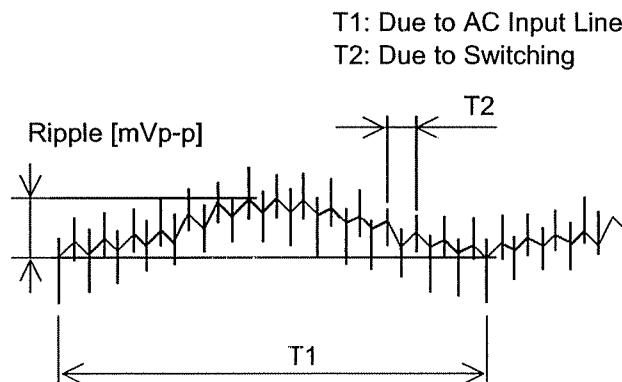


Fig. Complex Ripple Wave Form

Temperature 25°C
Testing Circuitry Figure A

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 85 [V]	Input Volt. 132 [V]
0.0	15	15
3.0	30	35
6.0	35	45
9.0	40	45
12.0	40	45
15.0	55	50
17.0	55	60
18.7	70	60
--	-	-
--	-	-
--	-	-

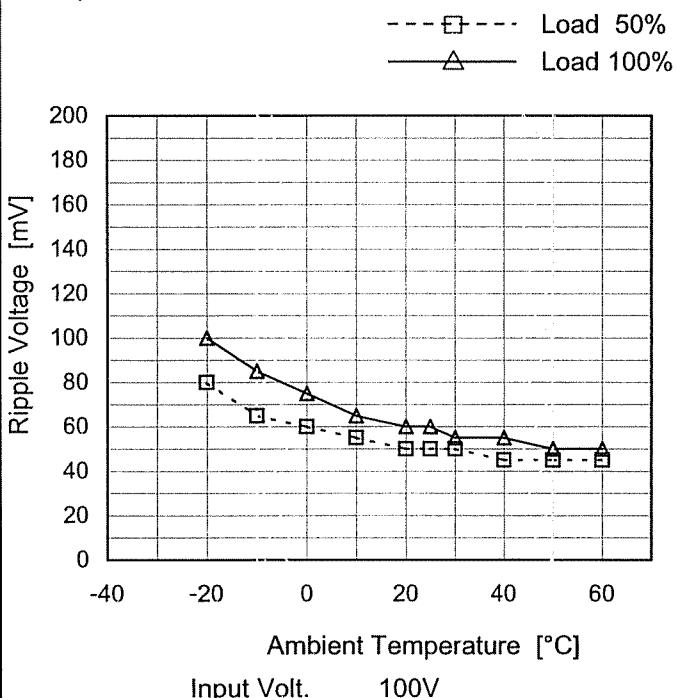
COSEL

Model	R150-9	Temperature	25°C																																				
Item	Ripple-Noise	Testing Circuitry	Figure A																																				
Object	+9V17A																																						
1.Graph			2.Values																																				
<p>Graph showing Ripple-Noise [mV] vs Load Current [A]. The Y-axis ranges from 0 to 200 mV, and the X-axis ranges from 0 to 20 A. Two curves are plotted: one for Input Volt. 85V (solid line with open triangles) and one for Input Volt. 132V (dashed line with open circles). Both curves show an increase in noise with increasing load current. A slanted line is drawn through the data points, representing the range of the rated load current.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Ripple-Noise [mV] (Input Volt. 85V)</th> <th>Ripple-Noise [mV] (Input Volt. 132V)</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>30</td><td>30</td></tr> <tr><td>3.0</td><td>40</td><td>50</td></tr> <tr><td>6.0</td><td>45</td><td>55</td></tr> <tr><td>9.0</td><td>50</td><td>55</td></tr> <tr><td>12.0</td><td>60</td><td>60</td></tr> <tr><td>15.0</td><td>65</td><td>65</td></tr> <tr><td>17.0</td><td>65</td><td>65</td></tr> <tr><td>18.7</td><td>75</td><td>65</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> </tbody> </table>				Load Current [A]	Ripple-Noise [mV] (Input Volt. 85V)	Ripple-Noise [mV] (Input Volt. 132V)	0.0	30	30	3.0	40	50	6.0	45	55	9.0	50	55	12.0	60	60	15.0	65	65	17.0	65	65	18.7	75	65	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple-Noise [mV] (Input Volt. 85V)	Ripple-Noise [mV] (Input Volt. 132V)																																					
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3.0	40	50																																					
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9.0	50	55																																					
12.0	60	60																																					
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18.7	75	65																																					
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<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>																																							
<p>Diagram illustrating a complex Ripple Wave Form. The diagram shows a waveform with two time intervals labeled T1 and T2. T1 is the full period of the waveform, and T2 is the period of the high-frequency switching component. The vertical axis is labeled "Ripple-Noise [mVp-p]".</p>																																							
<p>Fig. Complex Ripple Wave Form</p>																																							

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Model	R150-9
Item	Ripple Voltage (by Ambient Temp.)
Object	+9V17A

1.Graph



Measured by 20 MHz Oscilloscope.

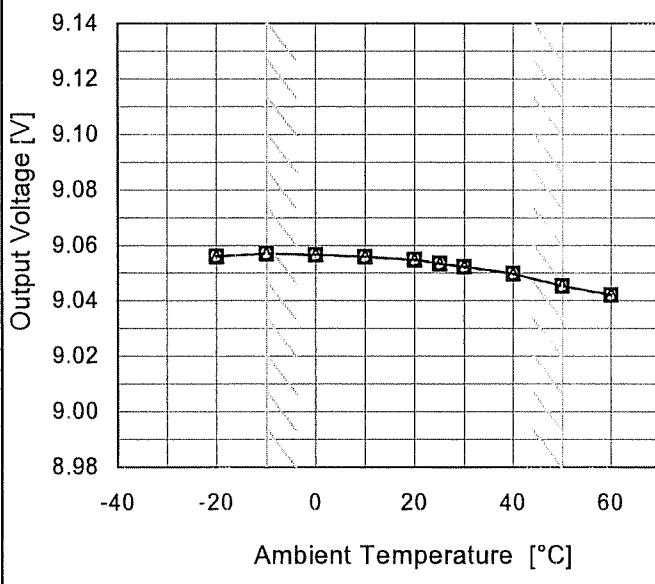
Note: Slanted line shows the range of the rated ambient temperature.

Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-20	80	100
-10	65	85
0	60	75
10	55	65
20	50	60
25	50	60
30	50	55
40	45	55
50	45	50
60	45	50
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COSEL

Model	R150-9	Testing Circuitry Figure A																																																					
Item	Ambient Temperature Drift																																																						
Object	+9V17A																																																						
1. Graph	—△— Input Volt. 85V - - -□--- Input Volt. 100V - - -○--- Input Volt. 132V																																																						
																																																							
	Note: Slanted line shows the range of the rated ambient temperature.																																																						
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Ambient Temperature [°C]	Output Voltage [V]																																																						
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Model	R150-9	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+9V17A	

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 - 50°C

Input Voltage : 85 - 132V

Load Current : 0 - 17A

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

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

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-10	132	0	9.084	±20	±0.2
Minimum Voltage	50	85	17	9.044		

COSEL

Model	R150-9	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+9V17A																								
1. Graph			2. Values																						
<p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 100V Load 100%</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>9.055</td></tr> <tr><td>0.5</td><td>9.052</td></tr> <tr><td>1.0</td><td>9.052</td></tr> <tr><td>2.0</td><td>9.052</td></tr> <tr><td>3.0</td><td>9.052</td></tr> <tr><td>4.0</td><td>9.052</td></tr> <tr><td>5.0</td><td>9.052</td></tr> <tr><td>6.0</td><td>9.052</td></tr> <tr><td>7.0</td><td>9.052</td></tr> <tr><td>8.0</td><td>9.052</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	9.055	0.5	9.052	1.0	9.052	2.0	9.052	3.0	9.052	4.0	9.052	5.0	9.052	6.0	9.052	7.0	9.052	8.0	9.052
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COSEL

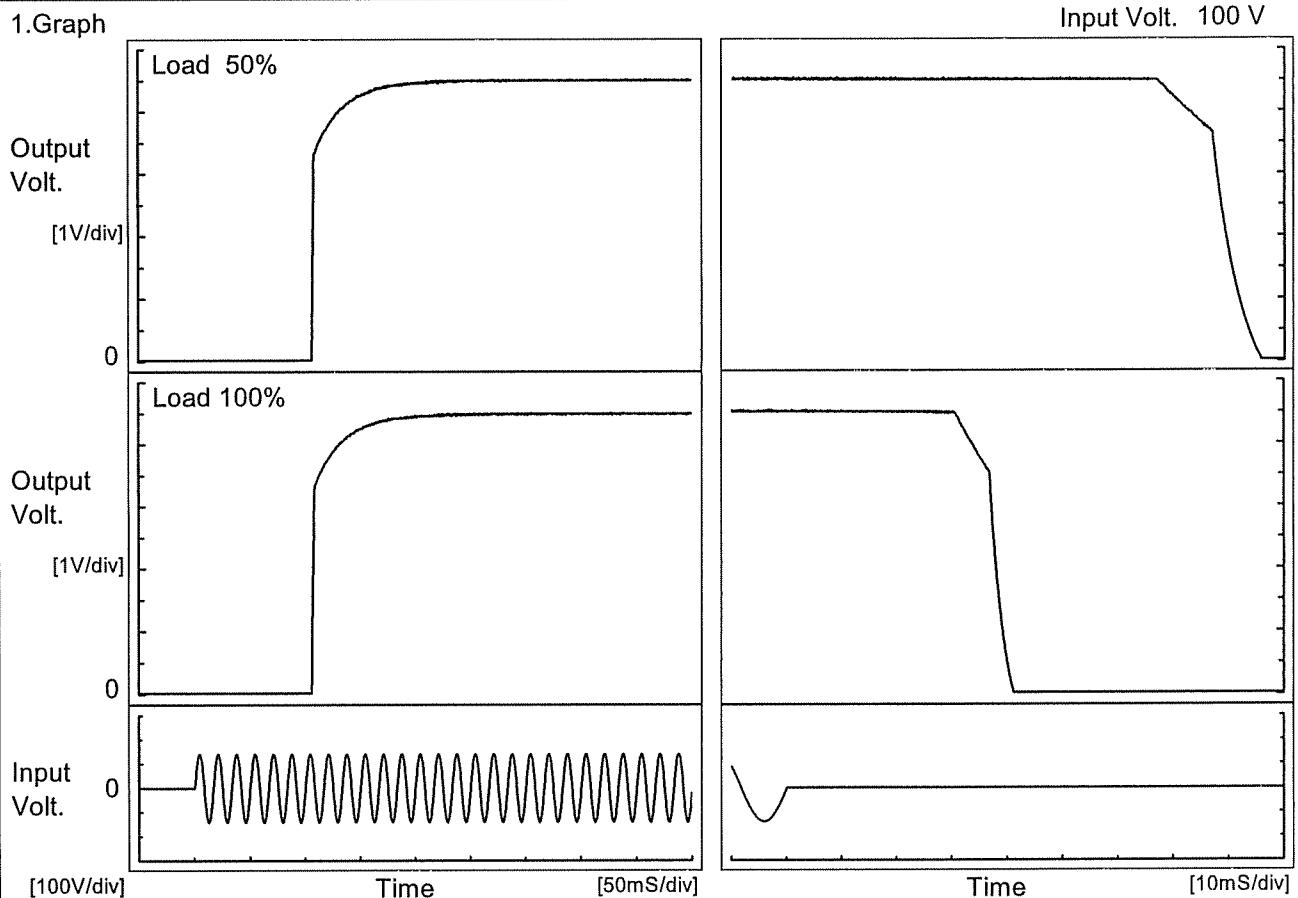
Model R150-9

Item Rise and Fall Time

Object +9V17A

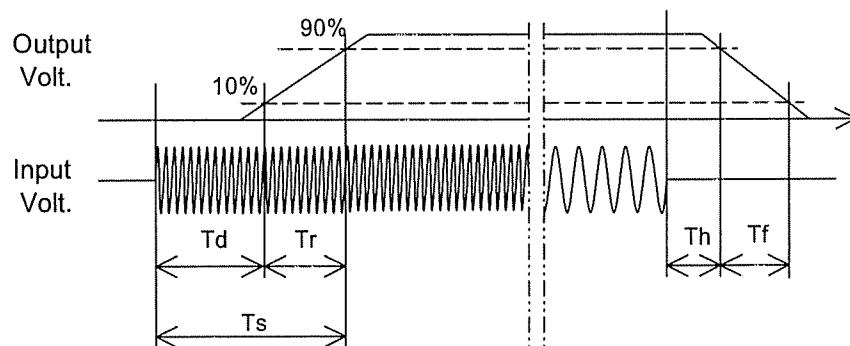
Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

Load	Time	Td	Tr	Ts	Th	Tf	[mS]
50 %		106.5	28.8	135.3	71.7	12.0	
100 %		106.3	29.3	135.6	33.1	7.1	

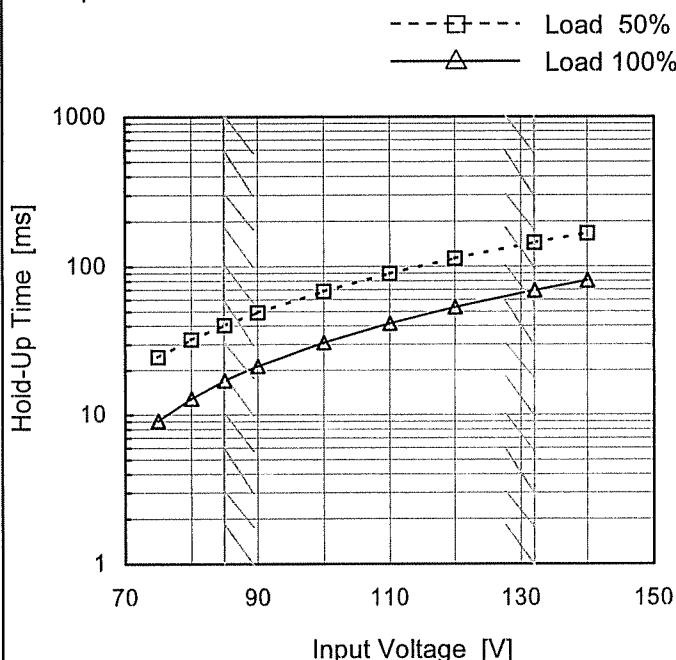


COSEL

Model	R150-9
Item	Hold-Up Time
Object	+9V17A

Temperature 25°C
 Testing Circuitry Figure A

1. Graph



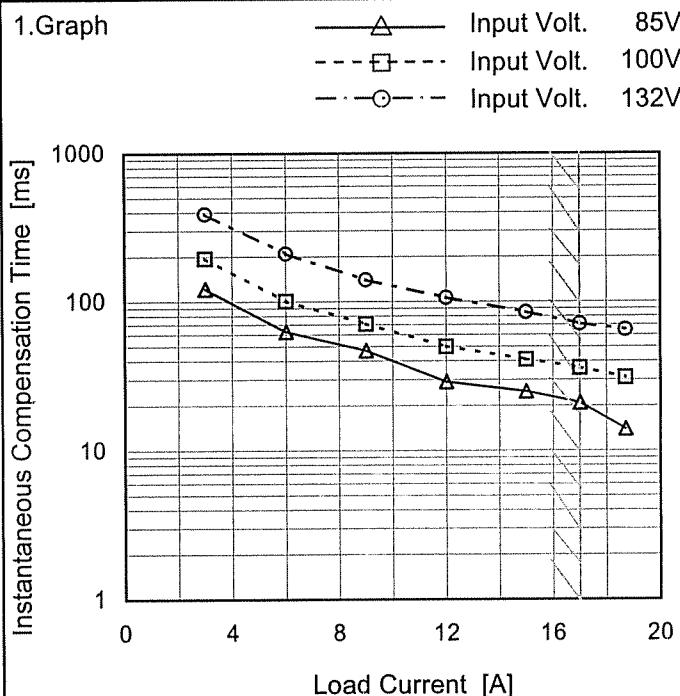
2. Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
75	25	9
80	32	13
85	40	17
90	49	21
100	68	31
110	90	42
120	113	54
132	145	69
140	167	81

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

COSEL

Model	R150-9
Item	Instantaneous Interruption Compensation
Object	+9V17A



Temperature 25°C
Testing Circuitry Figure A

2.Values

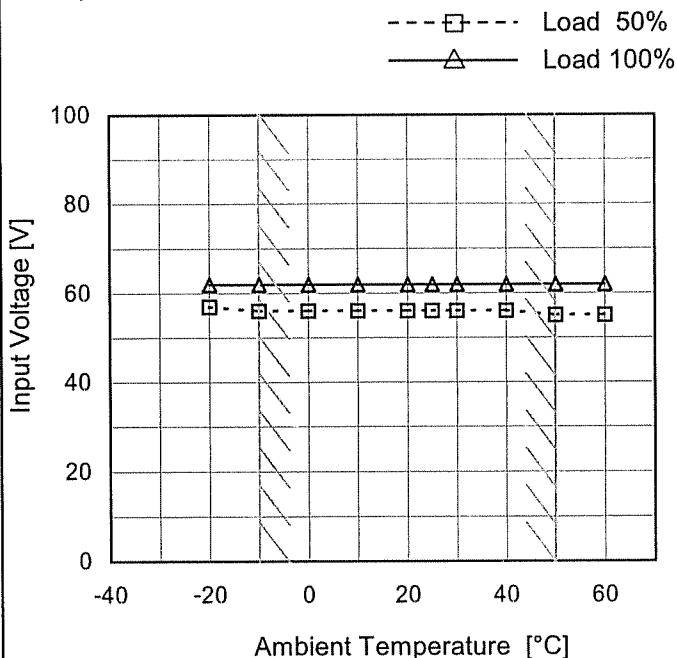
Load Current [A]	Time [ms]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	-	-	-
3.0	122	195	389
6.0	63	101	210
9.0	47	71	140
12.0	29	50	106
15.0	25	41	85
17.0	21	36	71
18.7	14	31	65
--	-	-	-
--	-	-	-
--	-	-	-

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

COSSEL

Model	R150-9
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+9V17A

1.Graph



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

Testing Circuitry Figure A

2.Values

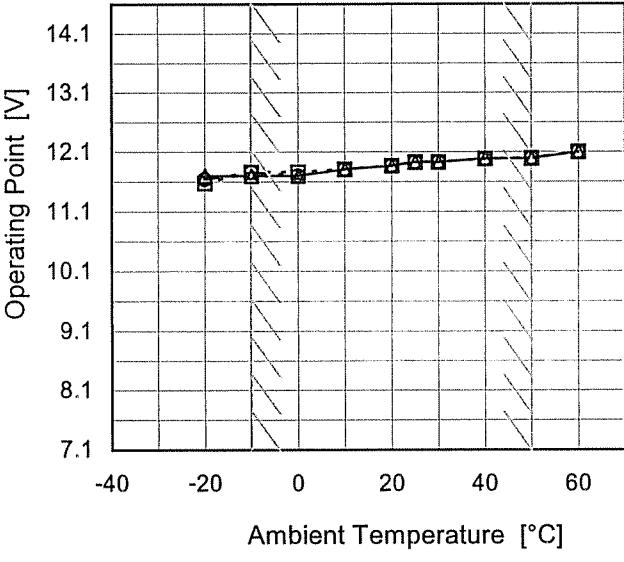
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	57	62
-10	56	62
0	56	62
10	56	62
20	56	62
25	56	62
30	56	62
40	56	62
50	55	62
60	55	62
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COSSEL

Model	R150-9	Temperature Testing Circuitry	25°C Figure A																																																							
Item	Overcurrent Protection																																																									
Object	+9V17A																																																									
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Note: Slanted line shows the range of the rated load current.

COSSEL

Model	R150-9	Testing Circuitry Figure A																																																					
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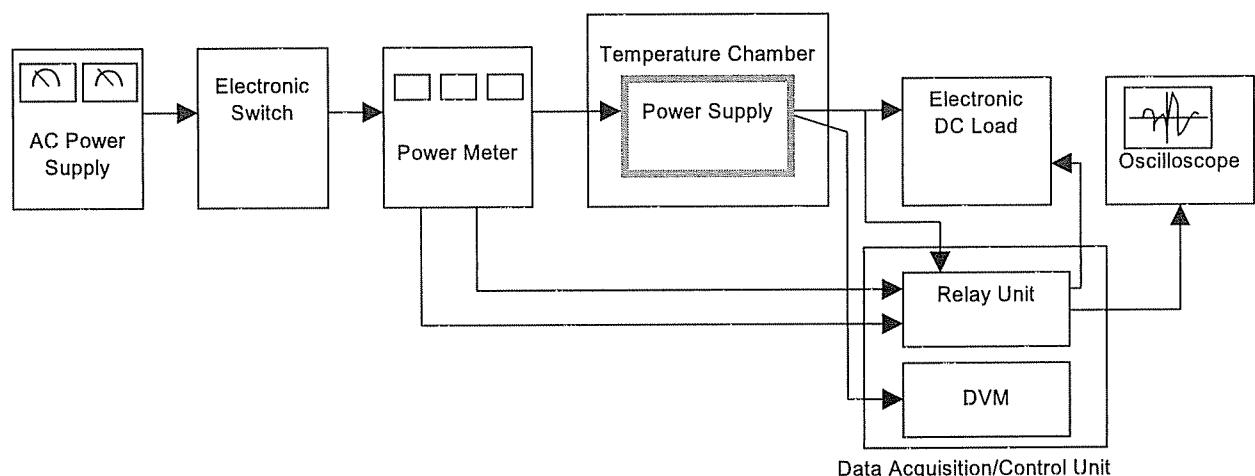


Figure A

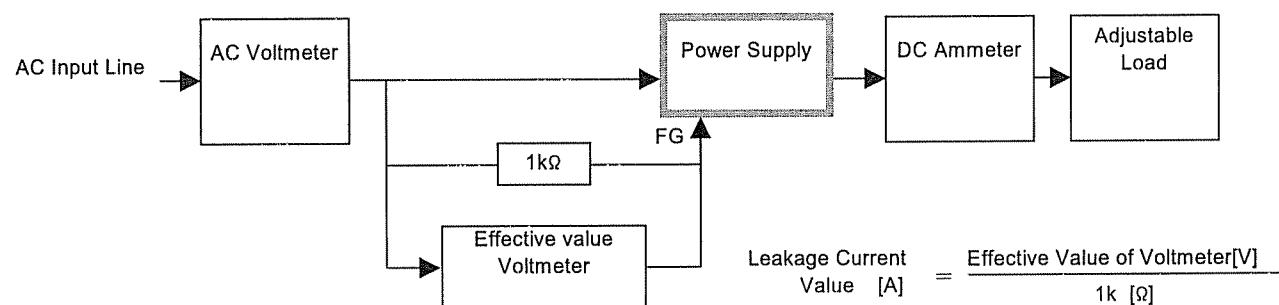


Figure B (DEN-AN)

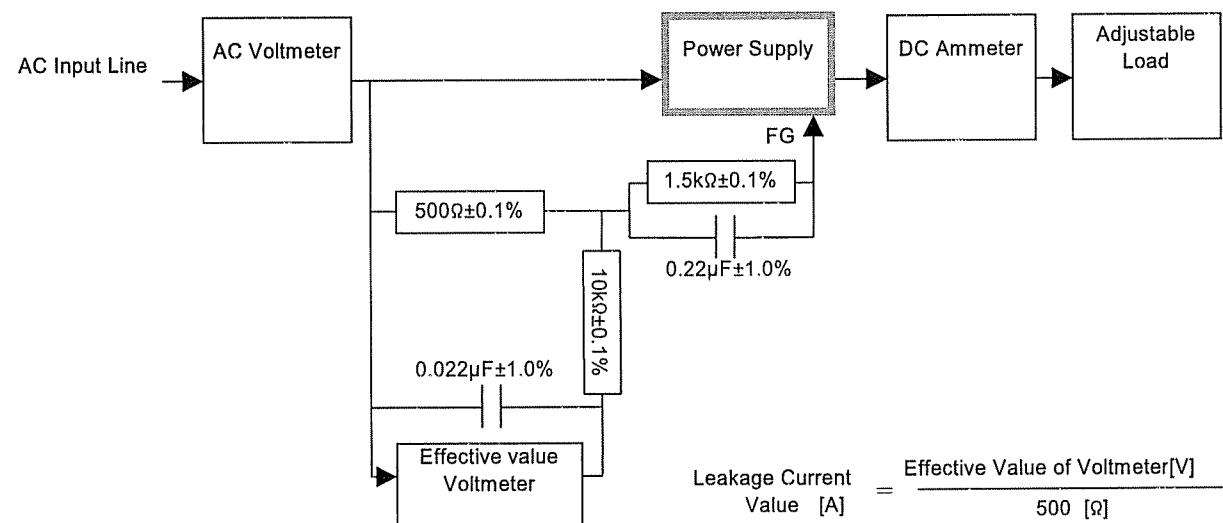


Figure B (IEC60950)