

TEST DATA OF GT2-24

Regulated DC Power Supply
April 12, 2010

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COSEL CO.,LTD.

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(Final Page 21)

COSEL

Model

GT2-24

Item

Input Current (by Load Current)

Object

1.Graph

—△—

Input Volt.

90V

---□---

Input Volt.

100V

---○---

Input Volt.

110V

Input Current [A]

1.0

0.8

0.6

0.4

0.2

0.0

0.0

0.4

0.8

1.2

Load Current [A]

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

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0.0	0.018	0.019	0.020
0.2	0.138	0.141	0.144
0.4	0.238	0.243	0.248
0.6	0.331	0.337	0.343
0.8	0.418	0.426	0.433
1.0	0.501	0.510	0.518
1.1	0.542	0.550	0.560
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model GT2-24

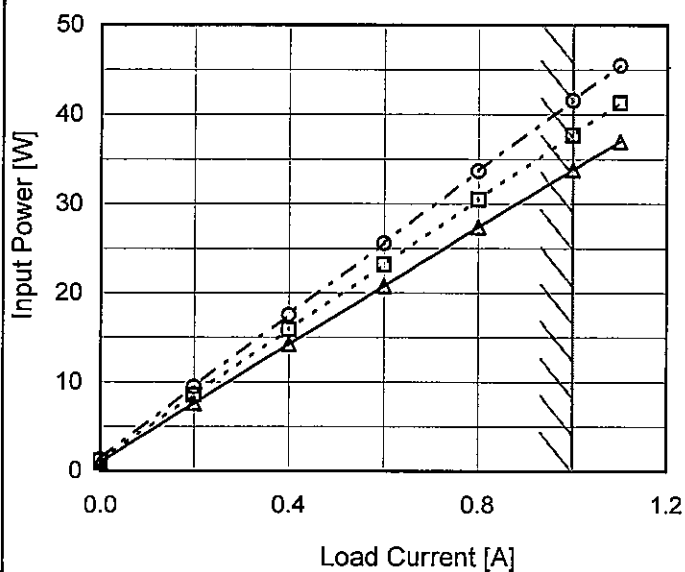
Item Input Power (by Load Current)

Object

Temperature 25°C
Testing Circuitry Figure A

1. Graph

—△— Input Volt. 90V
---□--- Input Volt. 100V
-·-○-·- Input Volt. 110V



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

2. Values

Load Current [A]	Input Power [W]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0.0	1.02	1.20	1.38
0.2	7.62	8.55	9.48
0.4	14.25	15.90	17.58
0.6	20.79	23.20	25.62
0.8	27.40	30.50	33.70
1.0	33.80	37.70	41.60
1.1	37.00	41.30	45.50
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model

GT2-24

Item

Efficiency (by Input Voltage)

Object

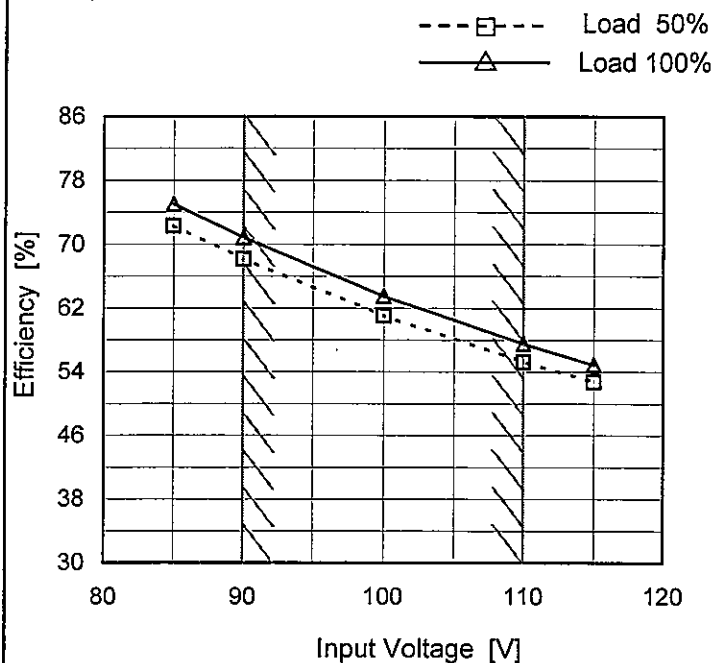
Temperature

25°C

Testing Circuitry

Figure A

1. Graph



2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
85	72.3	75.1
90	68.2	70.9
100	61.1	63.5
110	55.3	57.6
115	52.8	54.9
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model GT2-24

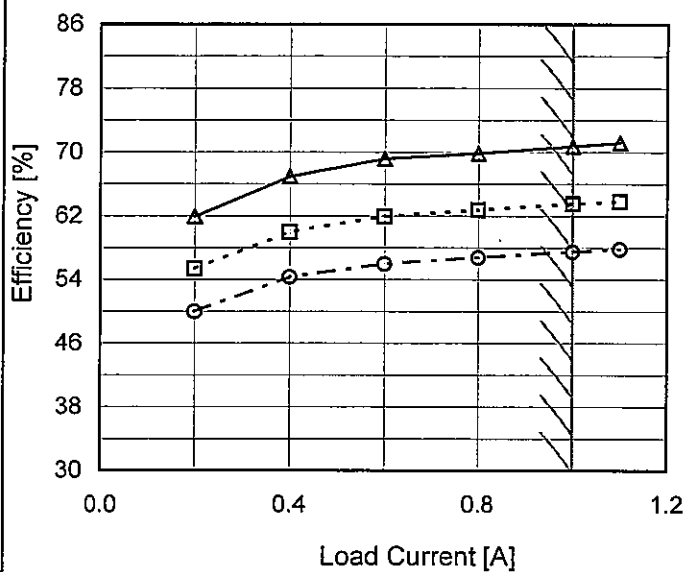
Item Efficiency (by Load Current)

Object

Temperature 25°C
Testing Circuitry Figure A

1.Graph

—△— Input Volt. 90V
---□--- Input Volt. 100V
---○--- Input Volt. 110V



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

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0.0	-	-	-
0.2	61.9	55.4	50.0
0.4	66.9	60.0	54.3
0.6	69.2	61.9	56.0
0.8	69.9	62.7	56.8
1.0	70.8	63.5	57.5
1.1	71.2	63.8	57.8
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Model		GT2-24	
Item		Power Factor (by Input Voltage)	
Object			
1.Graph		2.Values	

<

Model		GT2-24		Temperature		25°C																																																				
Item		Power Factor (by Load Current)		Testing Circuitry		Figure A																																																				
Object																																																										
1. Graph		<div><div><div>—△—</div><div>Input Volt.</div><div>90V</div></div><div><div>---□---</div><div>Input Volt.</div><div>100V</div></div><div><div>- -○- -</div><div>Input Volt.</div><div>110V</div></div></div> <div><div><div><div>Power Factor</div><div>0.8</div><div>0.7</div><div>0.6</div><div>0.5</div><div>0.4</div><div>0.3</div><div>0.2</div></div><div><div>0.0</div><div>0.4</div><div>0.8</div><div>1.2</div></div><div><div>Load Current [A]</div></div></div></div>		2. Values		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Power Factor</th></tr><tr><th>Input Volt. 90[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 110[V]</th></tr><tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>0.2</td><td>0.611</td><td>0.604</td><td>0.597</td></tr><tr><td>0.4</td><td>0.664</td><td>0.654</td><td>0.645</td></tr><tr><td>0.6</td><td>0.698</td><td>0.688</td><td>0.680</td></tr><tr><td>0.8</td><td>0.729</td><td>0.716</td><td>0.708</td></tr><tr><td>1.0</td><td>0.749</td><td>0.739</td><td>0.730</td></tr><tr><td>1.1</td><td>0.758</td><td>0.751</td><td>0.739</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. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]	0.0	-	-	-	0.2	0.611	0.604	0.597	0.4	0.664	0.654	0.645	0.6	0.698	0.688	0.680	0.8	0.729	0.716	0.708	1.0	0.749	0.739	0.730	1.1	0.758	0.751	0.739	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Power Factor																																																									
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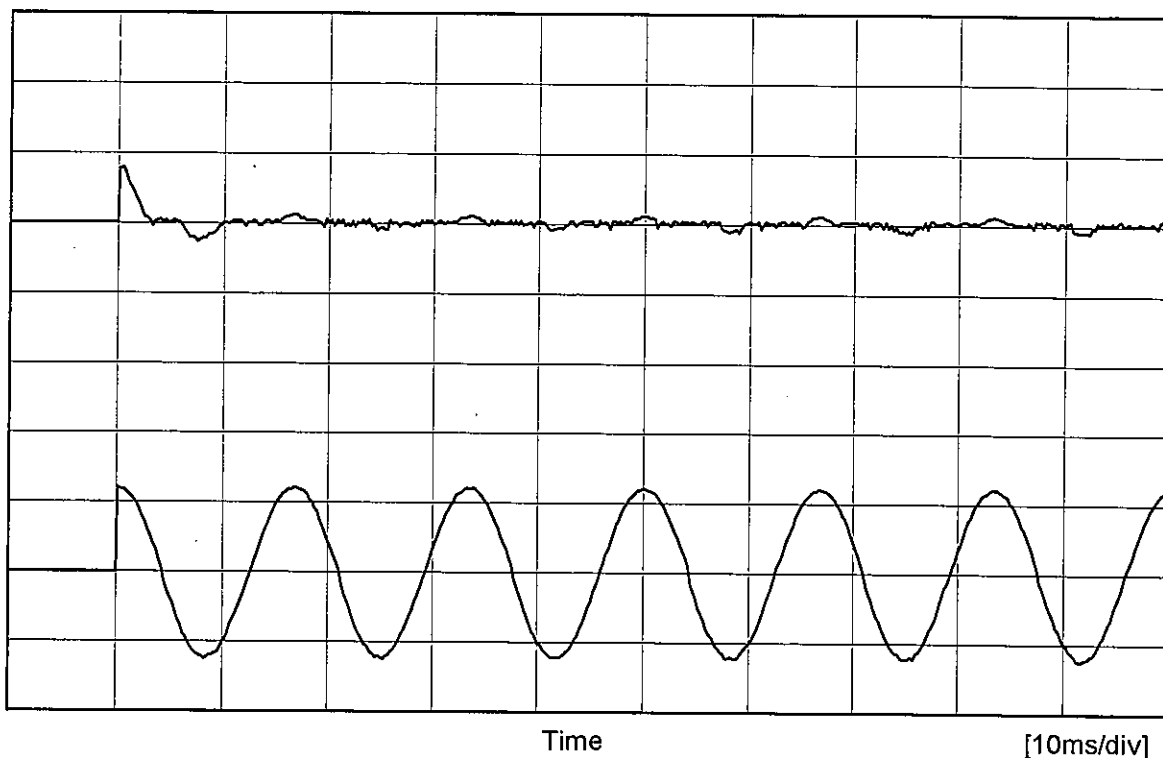
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Model	GT2-24	Temperature 25°C Testing Circuitry Figure A
Item	Inrush Current	
Object		

Input
Current
[10A/div]

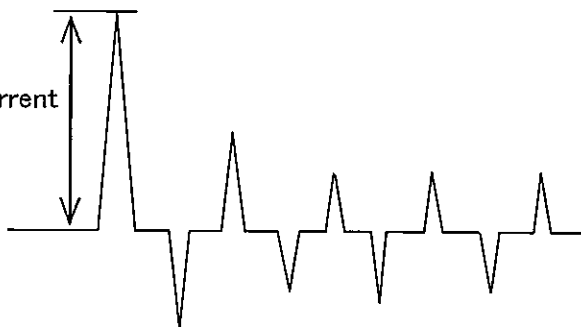
Input
Voltage
[100V/div]



Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current 7.9 A

Primary inrush current



Model	GT2-24																																
Item	Line Regulation	Temperature	25°C																														
Object	+24V1A	Testing Circuitry	Figure A																														
1.Graph		2.Values																															
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <table><thead><tr><th>Input Voltage [V]</th><th>Output Voltage [V] Load 50%</th><th>Output Voltage [V] Load 100%</th></tr></thead><tbody><tr><td>85</td><td>24.064</td><td>24.064</td></tr><tr><td>90</td><td>24.065</td><td>24.065</td></tr><tr><td>100</td><td>24.065</td><td>24.065</td></tr><tr><td>110</td><td>24.065</td><td>24.065</td></tr><tr><td>115</td><td>24.066</td><td>24.066</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></tbody></table> <p>Note: Slanted line shows the range of the rated input voltage.</p>		Input Voltage [V]	Output Voltage [V] Load 50%	Output Voltage [V] Load 100%	85	24.064	24.064	90	24.065	24.065	100	24.065	24.065	110	24.065	24.065	115	24.066	24.066	--	-	-	--	-	-	--	-	-	--	-	-		
Input Voltage [V]	Output Voltage [V] Load 50%	Output Voltage [V] Load 100%																															
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COSEL

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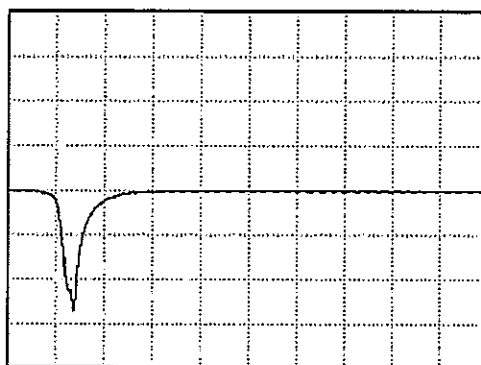
Model	GT2-24	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+24V1A		

Input Volt. 100 V
Cycle 1000 ms

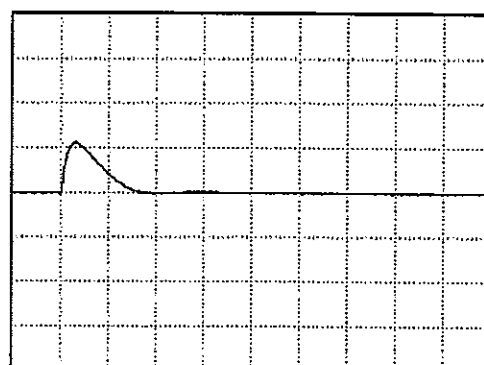
Load Current

Min. Load (0A) ←→
Load 100% (1A)

50 mV/div



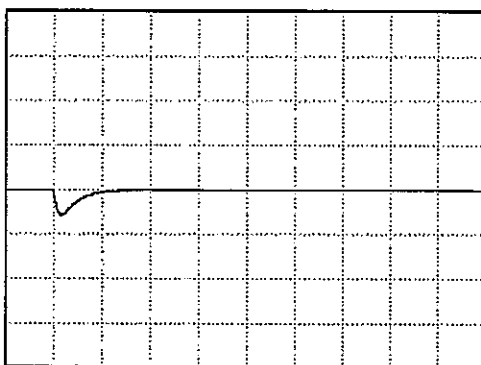
100 μ s/div



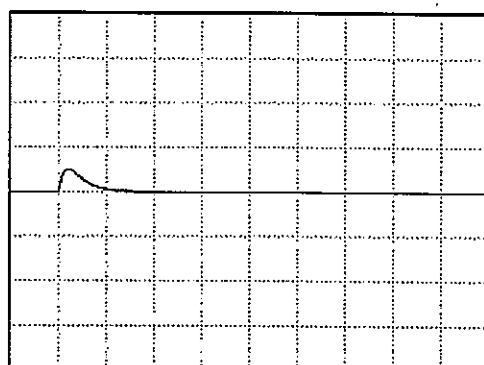
100 μ s/div

Load 50% (0.5A) ←→
Load 100% (1A)

50 mV/div



100 μ s/div



100 μ s/div

Model	GT2-24	Temperature 25°C Testing Circuitry Figure A																																										
Item	Ripple Voltage (by Load Current)																																											
Object	+24V1A																																											
1.Graph		2.Values																																										
<div><div><div>—△—</div><div>Input Volt. 90V</div></div><div><div>-○-</div><div>Input Volt. 110V</div></div></div> <p>Measured by 20 MHz Oscilloscope. Note: Slanted line shows the range of the rated load current.</p>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 90 [V]</th><th>Input Volt. 110 [V]</th></tr><tr><td>0.0</td><td>1.0</td><td>1.0</td></tr><tr><td>0.5</td><td>1.2</td><td>1.2</td></tr><tr><td>1.0</td><td>1.2</td><td>1.2</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Load Current [A]	Ripple Voltage [mV]		Input Volt. 90 [V]	Input Volt. 110 [V]	0.0	1.0	1.0	0.5	1.2	1.2	1.0	1.2	1.2	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																											
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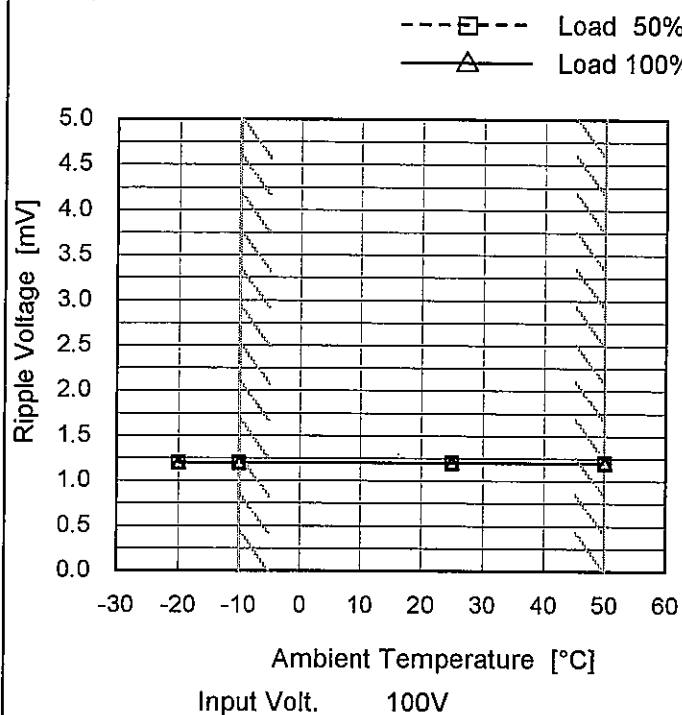
Model GT2-24

Item Ripple Voltage (by Ambient Temp.)

Object +24V1A

Testing Circuitry Figure A

1. Graph



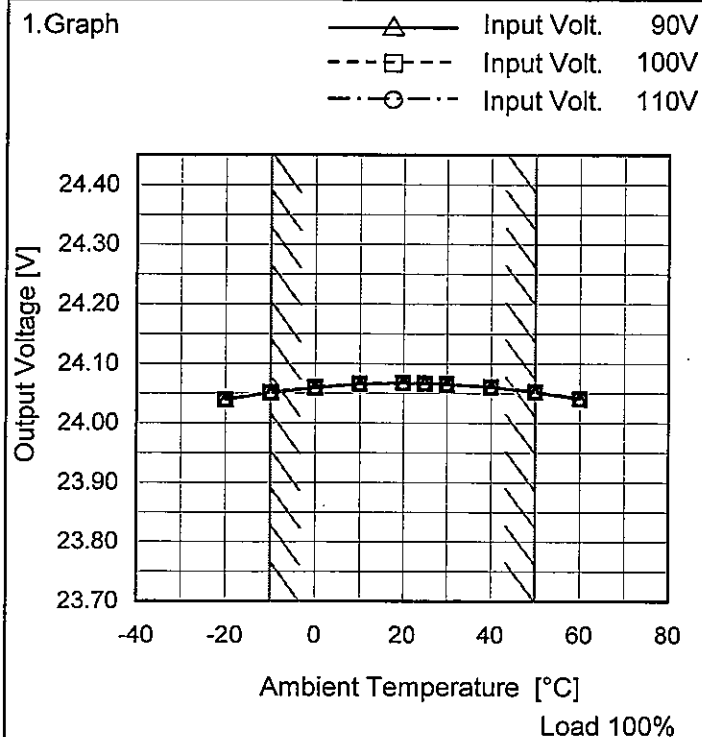
Measured by 20 MHz Oscilloscope.

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

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-20	1.2	1.2
-10	1.2	1.2
25	1.2	1.2
50	1.2	1.2
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Model	GT2-24
Item	Ambient Temperature Drift
Object	+24V1A



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

Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
-20	24.039	24.040	24.040
-10	24.051	24.052	24.052
0	24.060	24.060	24.061
10	24.066	24.066	24.067
20	24.068	24.068	24.068
25	24.067	24.067	24.068
30	24.065	24.066	24.066
40	24.061	24.061	24.062
50	24.052	24.053	24.053
60	24.041	24.041	24.041
--	-	-	-

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		Testing Circuitry Figure A
Model	GT2-24	
Item	Output Voltage Accuracy	
Object	+24V1A	

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 : 90 - 110V

Load Current : 0 - 1A

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

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

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	20	110	0	24.068	±9	±0.1
Minimum Voltage	-10	90	0	24.051		

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Model	GT2-24		
Item	Time Lapse Drift	Temperature	25°C
Object	+24V1A	Testing Circuitry	Figure A
1.Graph		2.Values	
<div><div>Output Voltage [V]</div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></di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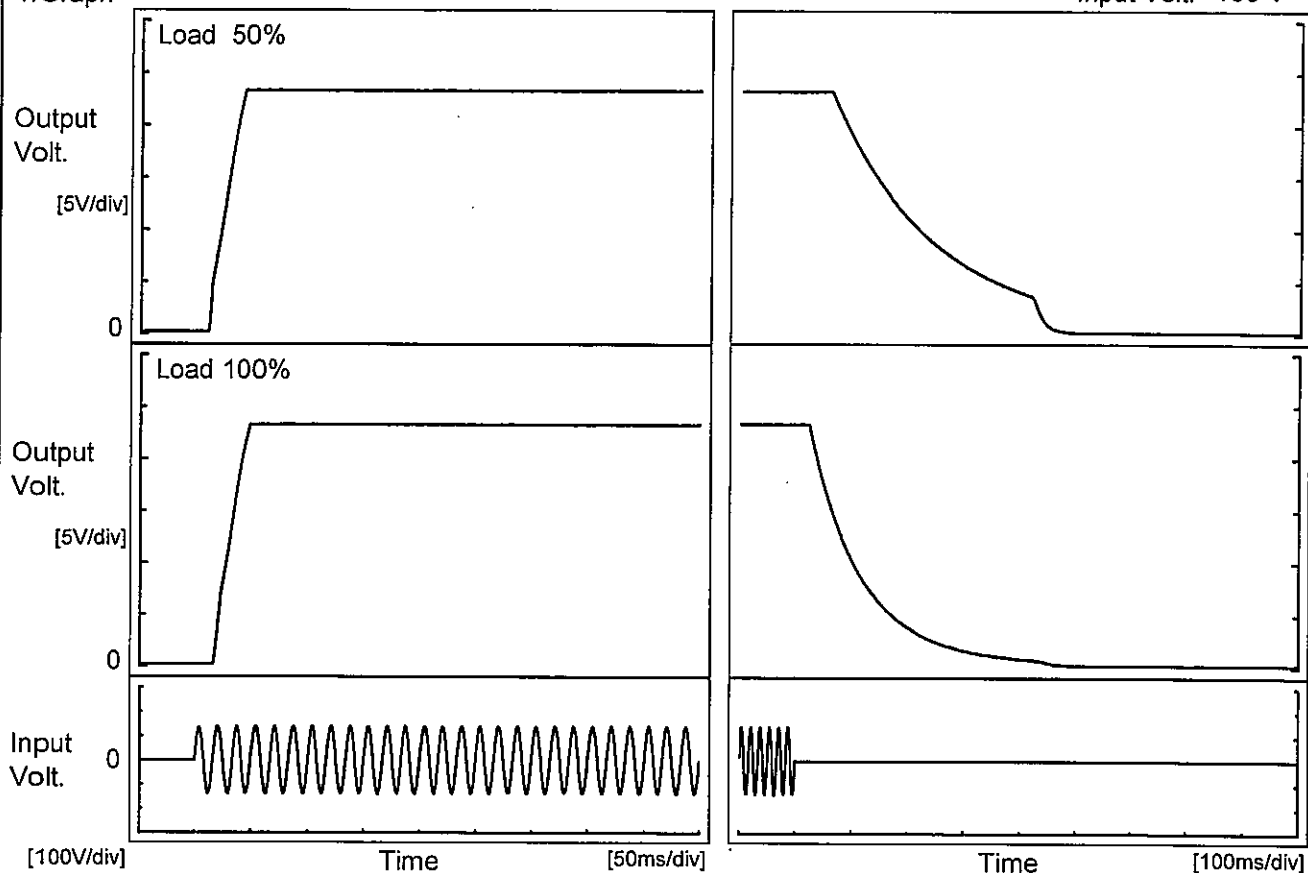
Model GT2-24

Item Rise and Fall Time

Object +24V1A

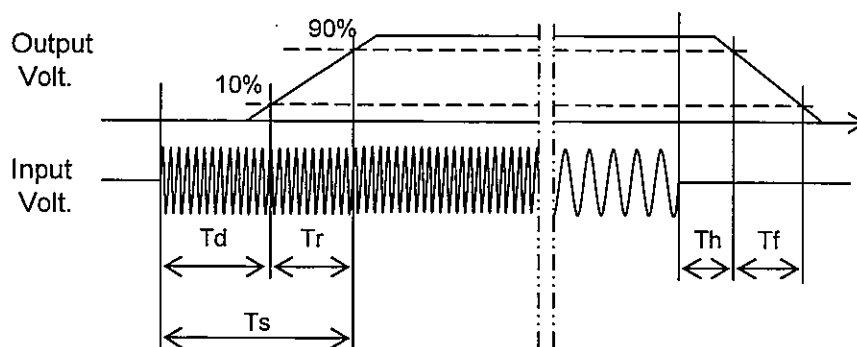
Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

		[ms]				
Load	Time	Td	Tr	Ts	Th	Tf
50 %		13.5	27.0	40.5	74.0	354.5
100 %		19.3	26.5	45.8	30.0	215.0



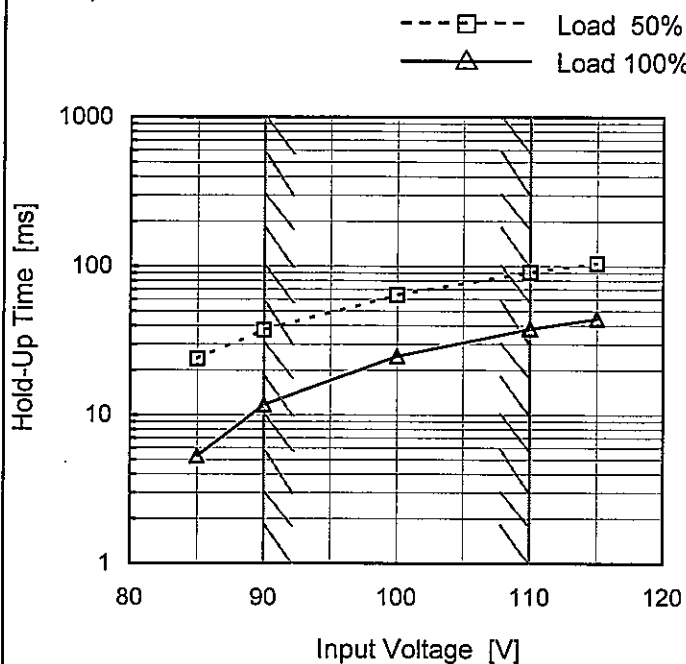
Model GT2-24

Item Hold-Up Time

Object +24V1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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.

2.Values

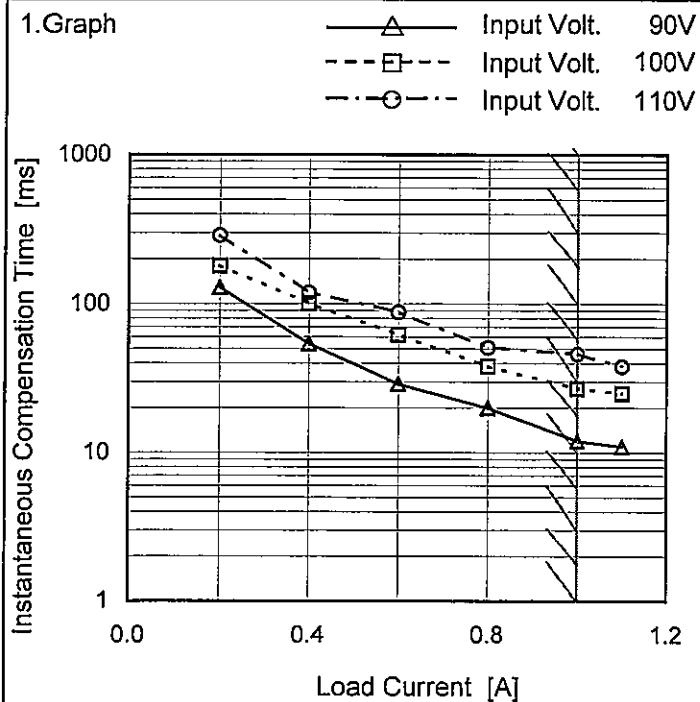
Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	24	5
90	37	12
100	64	25
110	91	38
115	104	45
--	-	-
--	-	-
--	-	-
--	-	-

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Model GT2-24

Item Instantaneous Interruption Compensation

Object +24V1A

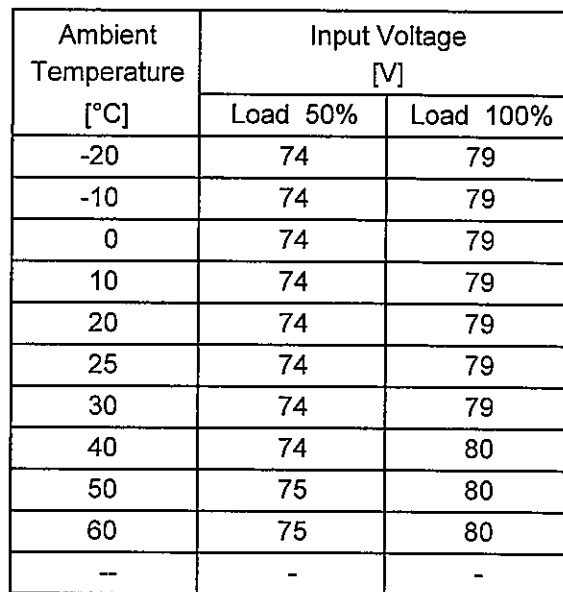
Temperature 25°C
Testing Circuitry Figure A

2. Values

Load Current [A]	Time [ms]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0.0	-	-	-
0.2	129	180	288
0.4	54	100	119
0.6	29	62	88
0.8	20	38	51
1.0	12	27	46
1.1	11	25	38
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

Testing Circuitry Figure A

2.Values



- 19 -

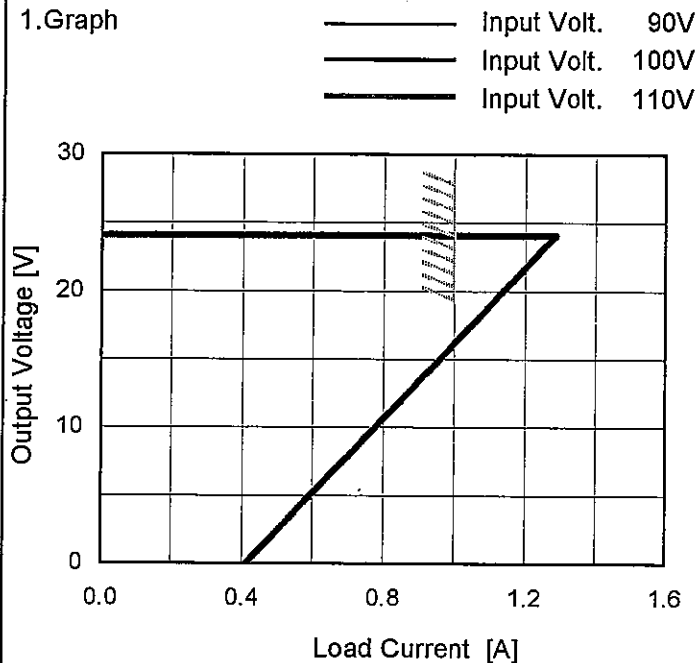
Model GT2-24

Item Overcurrent Protection

Object +24V1A

Temperature 25°C
Testing Circuitry Figure A

1. Graph



2. Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
24.0	1.29	1.29	1.29
22.8	1.24	1.24	1.24
21.6	1.20	1.20	1.20
19.2	1.12	1.11	1.11
16.8	1.03	1.03	1.02
14.4	0.94	0.94	0.94
12.0	0.85	0.85	0.85
9.6	0.76	0.76	0.76
7.2	0.68	0.68	0.68
4.8	0.59	0.59	0.59
2.4	0.50	0.50	0.50
0.0	0.41	0.41	0.41

COSEL

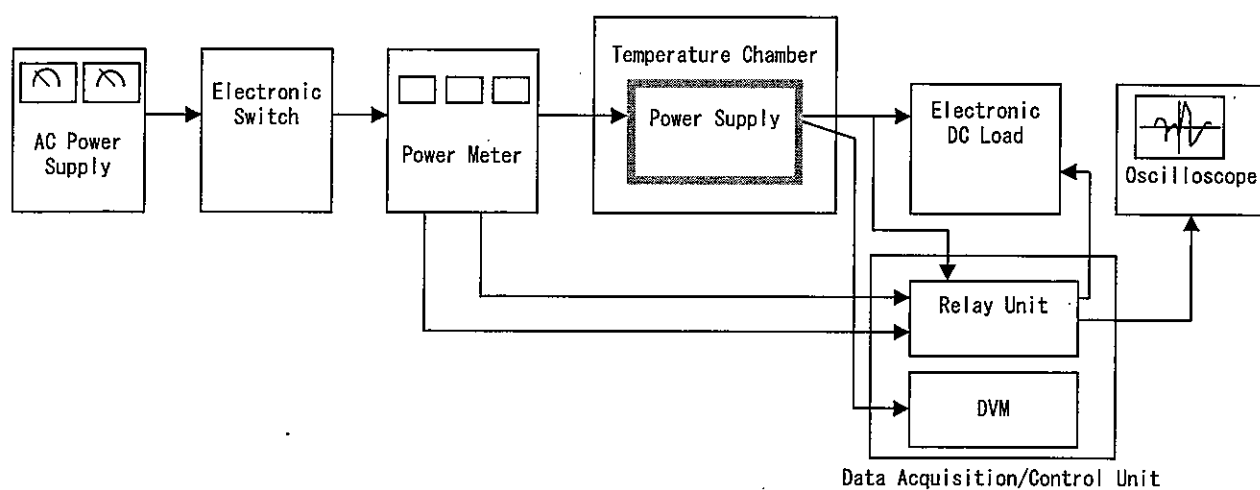


Figure A