

TEST DATA OF GT5-24

Regulated DC Power Supply
July 23, 2010

Approved by : Eiyoshi Wakamatsu
Eiyoshi Wakamatsu Design Manager

Prepared by : Satoshi Kinoshita
Satoshi Kinoshita Design Engineer

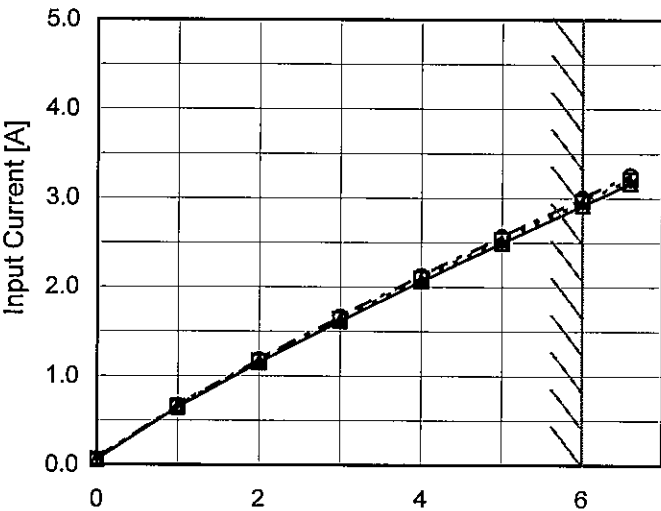
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Model GT5-24

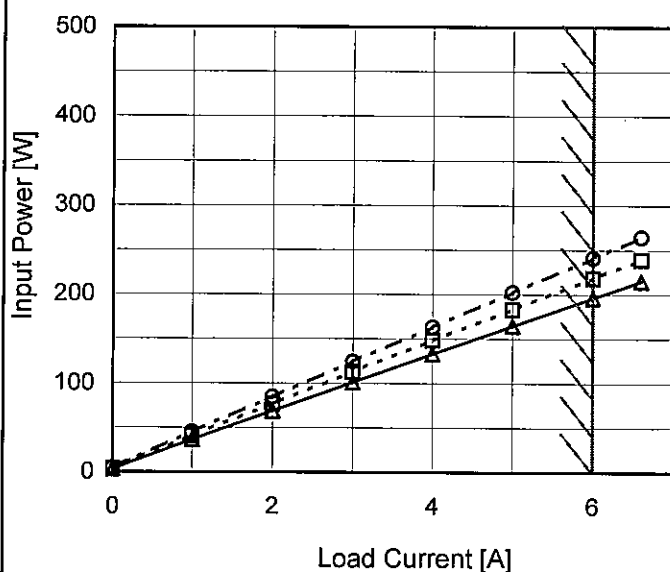
Item Input Power (by Load Current)

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	3.4	4.0	4.7
1.0	36.2	40.5	44.8
2.0	68.6	76.6	84.5
3.0	101.1	112.8	124.2
4.0	132.9	148.2	163.2
5.0	164.4	183.3	202.2
6.0	196.2	218.4	240.9
6.6	214.8	239.1	264.3
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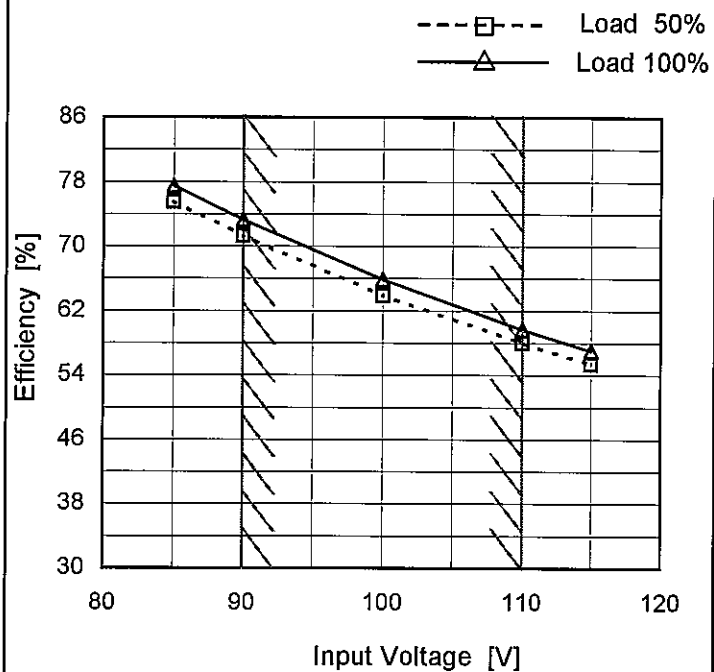
Model GT5-24

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	75.5	77.5
90	71.3	73.3
100	63.9	65.8
110	58.0	59.7
115	55.3	57.1
--	-	-
--	-	-
--	-	-
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Note: Slanted line shows the range of the rated input voltage.

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Model	GT5-24																																
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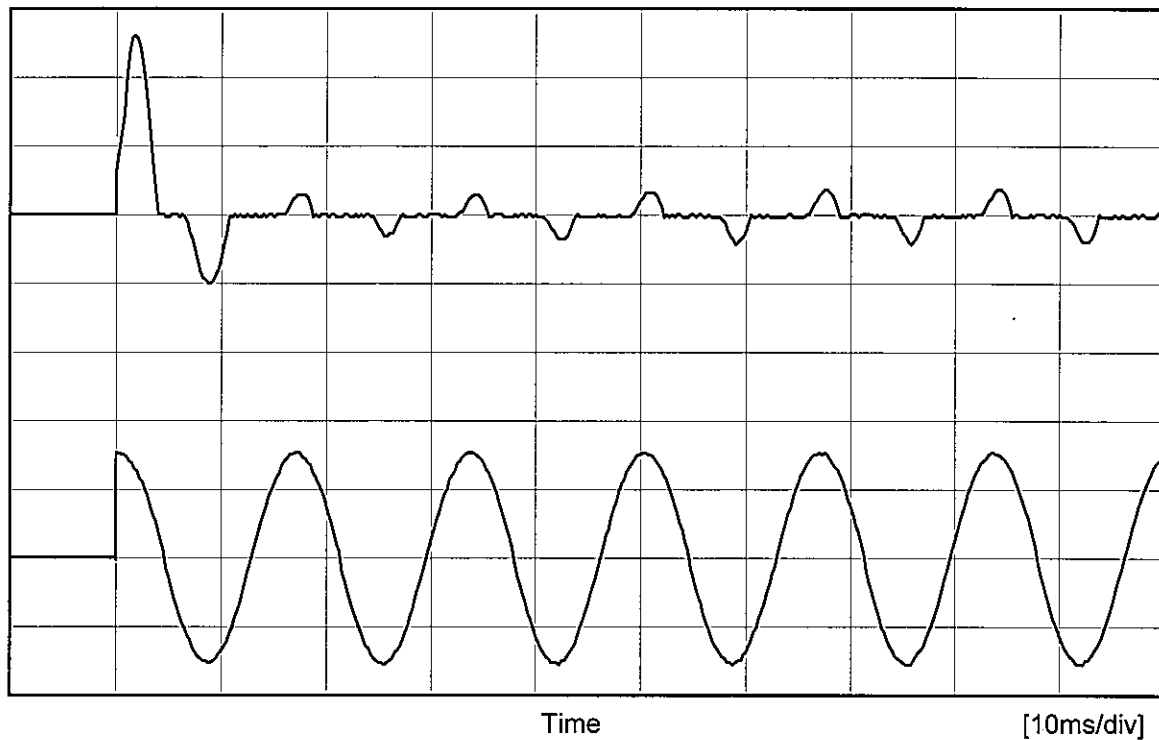
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Model	GT5-24	Temperature 25°C Testing Circuitry Figure A	
Item	Inrush Current		
Object	_____		

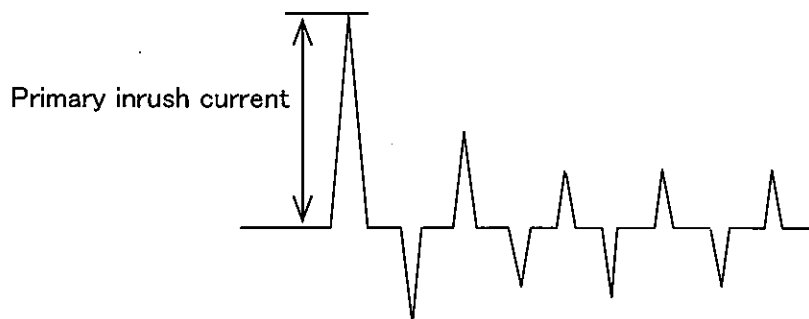
Input
Current
[20A/div]

Input
Voltage
[100V/div]



Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current 52.2 A



Model	GT5-24																																
Item	Line Regulation	Temperature	25°C																														
Object	+24V6A	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> <p>The graph plots Output Voltage [V] on the y-axis (ranging from 23.60 to 24.30 in 0.10 increments) against Input Voltage [V] on the x-axis (ranging from 80 to 120 in 10 increments). Two data series are shown: Load 50% (dashed line with square markers) and Load 100% (solid line with triangle markers). Both series show a constant output voltage of approximately 24.019V across the input range. Two vertical slanted lines are drawn at input voltages of 90V and 110V, indicating the rated input voltage range.</p> <table border="1"><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>24.019</td><td>24.018</td></tr><tr><td>90</td><td>24.019</td><td>24.018</td></tr><tr><td>100</td><td>24.019</td><td>24.019</td></tr><tr><td>110</td><td>24.020</td><td>24.019</td></tr><tr><td>115</td><td>24.020</td><td>24.019</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	24.019	24.018	90	24.019	24.018	100	24.019	24.019	110	24.020	24.019	115	24.020	24.019	--	-	-	--	-	-	--	-	-	--	-	-		
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Model

GT5-24

Item

Load Regulation

Object

+24V6A

1.Graph

—△—

Input Volt.

90V

---□---

Input Volt.

100V

-·-○-·-

Input Volt.

110V

Output Voltage [V]

Load Current [A]

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

Temperature

25°C

Testing Circuitry

Figure A

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
0.0	24.018	24.018	24.019
1.0	24.018	24.018	24.019
2.0	24.018	24.018	24.019
3.0	24.018	24.018	24.019
4.0	24.018	24.018	24.018
5.0	24.018	24.018	24.018
6.0	24.018	24.018	24.018
6.6	24.018	24.018	24.018
--	-	-	-
--	-	-	-
--	-	-	-



Model	GT5-24	Temperature Testing Circuitry	25°C Figure A
Item	Dynamic Load Response		
Object	+24V6A		

Input Volt. 100 V
Cycle 1000 ms

Load Current

Min. Load (0A) ←→
Load 100% (6A)

200 mV/div

100 μ s/div

100 μ s/div

Load 50% (3A) ←→
Load 100% (6A)

200 mV/div

100 μ s/div

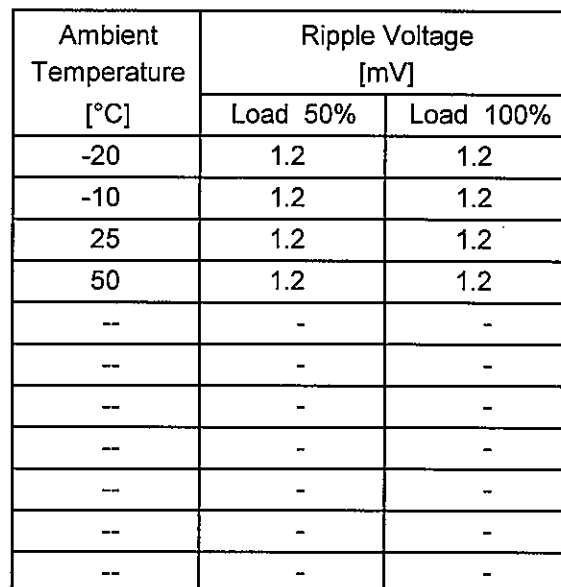
100 μ s/div

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Model	GT5-24		
Item	Ripple Voltage (by Load Current)	Temperature	25°C
		Testing Circuitry	Figure A
Object	+24V6A		
1.Graph		2.Values	
<div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> <div><div></div><div></div></div> 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Testing Circuitry Figure A

2.Values



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

COSEL

Model GT5-24

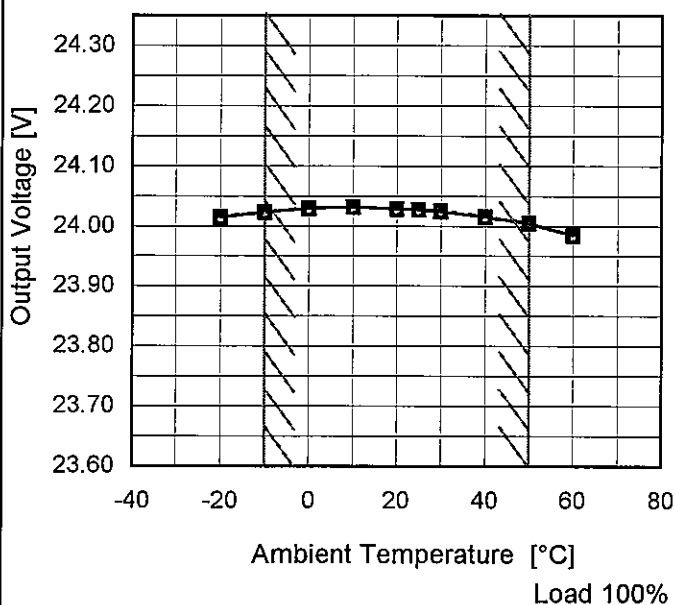
Item Ambient Temperature Drift

Object +24V6A

Testing Circuitry Figure A

1. Graph

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



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

2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]
-20	24.014	24.015	24.015
-10	24.023	24.023	24.023
0	24.029	24.029	24.030
10	24.031	24.031	24.032
20	24.028	24.029	24.029
25	24.027	24.027	24.027
30	24.024	24.025	24.025
40	24.015	24.015	24.015
50	24.005	24.005	24.005
60	23.985	23.985	23.985
--	-	-	-



		Testing Circuitry Figure A
Model	GT5-24	
Item	Output Voltage Accuracy	
Object	+24V6A	

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 - 6A

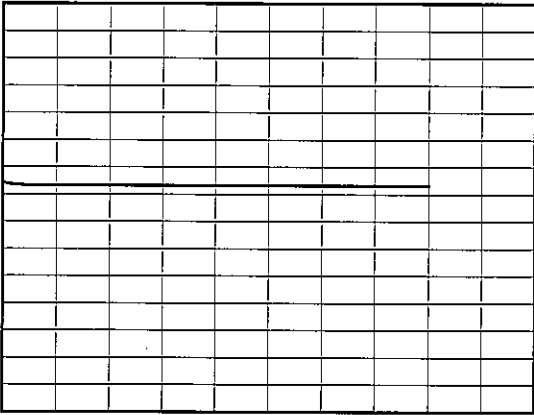
* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	10	110	0	24.032	±14	±0.1
Minimum Voltage	50	90	6	24.005		

COSEL

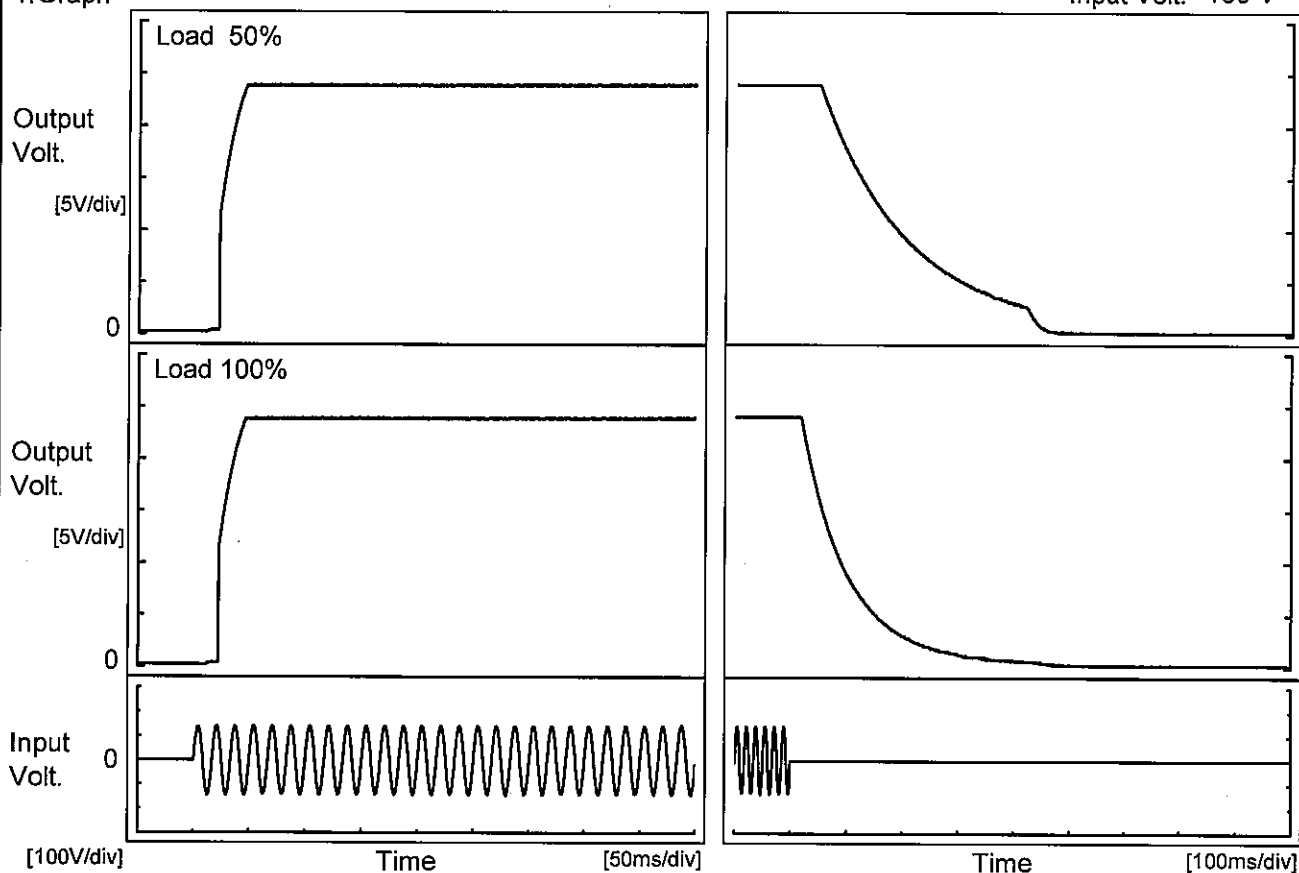
Model		GT5-24		Temperature 25°C																							
Item		Time Lapse Drift		Testing Circuitry Figure A																							
Object		+24V6A																									
1.Graph				2.Values																							
<div><div>Output Voltage [V]</div><div></div><div>Time [H]</div><div>Input Volt. 100V</div><div>Load 100%</div></div>				<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>24.024</td></tr><tr><td>0.5</td><td>24.017</td></tr><tr><td>1.0</td><td>24.016</td></tr><tr><td>2.0</td><td>24.016</td></tr><tr><td>3.0</td><td>24.016</td></tr><tr><td>4.0</td><td>24.016</td></tr><tr><td>5.0</td><td>24.016</td></tr><tr><td>6.0</td><td>24.016</td></tr><tr><td>7.0</td><td>24.016</td></tr><tr><td>8.0</td><td>24.016</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	24.024	0.5	24.017	1.0	24.016	2.0	24.016	3.0	24.016	4.0	24.016	5.0	24.016	6.0	24.016	7.0	24.016	8.0	24.016
Time since start [H]	Output Voltage [V]																										
0.0	24.024																										
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5.0	24.016																										
6.0	24.016																										
7.0	24.016																										
8.0	24.016																										

COSEL

Model	GT5-24	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+24V6A		

1. Graph

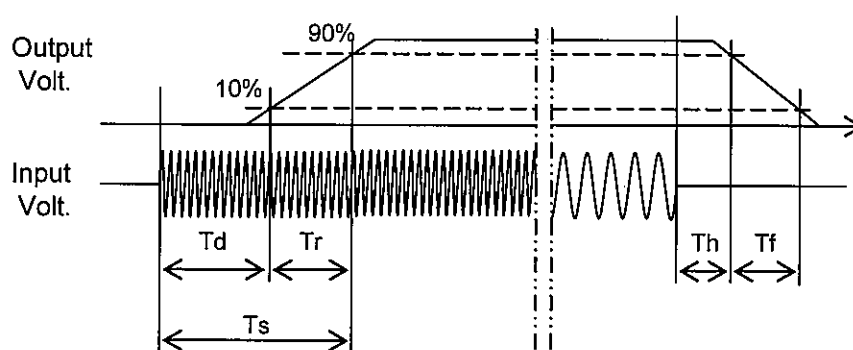
Input Volt. 100 V



2. Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	22.3	18.3	40.6	66.0	357.5
100 %	22.3	18.3	40.6	26.5	191.5



BC-10210

COSEL

Model	GT5-24																																																					
Item	Instantaneous Interruption Compensation	Temperature	25°C																																																			
Object	+24V6A	Testing Circuitry	Figure A																																																			
1.Graph		2.Values																																																				
<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> <p>Instantaneous Compensation Time [ms]</p> <p>Load Current [A]</p> <p>Note: Slanted line shows the range of the rated load current.</p>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Time [ms]</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>1.0</td><td>130</td><td>212</td><td>268</td></tr><tr><td>2.0</td><td>54</td><td>105</td><td>128</td></tr><tr><td>3.0</td><td>29</td><td>63</td><td>80</td></tr><tr><td>4.0</td><td>13</td><td>38</td><td>48</td></tr><tr><td>5.0</td><td>12</td><td>29</td><td>54</td></tr><tr><td>6.0</td><td>4</td><td>15</td><td>30</td></tr><tr><td>6.6</td><td>4</td><td>13</td><td>29</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. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]	0.0	-	-	-	1.0	130	212	268	2.0	54	105	128	3.0	29	63	80	4.0	13	38	48	5.0	12	29	54	6.0	4	15	30	6.6	4	13	29	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																					
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COSEL

Model

GT5-24

Item

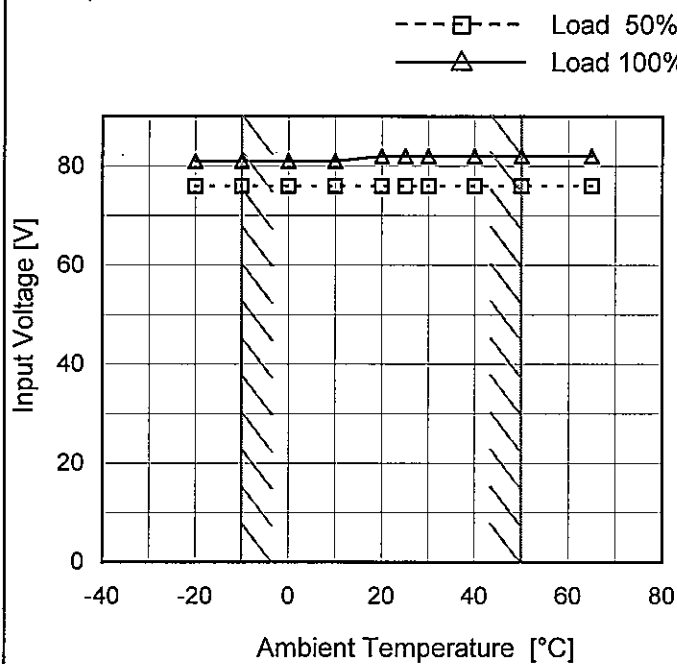
Minimum Input Voltage
for Regulated Output Voltage

Object

+24V6A

Testing Circuitry Figure A

1. Graph



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

2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	76	81
-10	76	81
0	76	81
10	76	81
20	76	82
25	76	82
30	76	82
40	76	82
50	76	82
65	76	82
--	-	-

Model	GT5-24																																																									
Item	Overcurrent Protection	Temperature	25°C																																																							
Object	+24V6A	Testing Circuitry	Figure A																																																							
1.Graph		2.Values																																																								
<div><div><div></div><div>Input Volt. 90V</div></div><div><div></div><div>Input Volt. 100V</div></div><div><div></div><div>Input Volt. 110V</div></div></div> <p>Note: Slanted line shows the range of the rated load current.</p>		<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="3">Load Current [A]</th></tr><tr><th>Input Volt. 90[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 110[V]</th></tr><tr><td>24.0</td><td>7.56</td><td>7.56</td><td>7.56</td></tr><tr><td>22.8</td><td>7.39</td><td>7.39</td><td>7.38</td></tr><tr><td>21.6</td><td>7.12</td><td>7.12</td><td>7.12</td></tr><tr><td>19.2</td><td>6.63</td><td>6.63</td><td>6.65</td></tr><tr><td>16.8</td><td>6.05</td><td>6.06</td><td>6.06</td></tr><tr><td>14.4</td><td>5.55</td><td>5.54</td><td>5.55</td></tr><tr><td>12.0</td><td>5.00</td><td>5.00</td><td>5.00</td></tr><tr><td>9.6</td><td>4.49</td><td>4.49</td><td>4.49</td></tr><tr><td>7.2</td><td>3.96</td><td>3.96</td><td>3.96</td></tr><tr><td>4.8</td><td>3.43</td><td>3.43</td><td>3.43</td></tr><tr><td>2.4</td><td>2.91</td><td>2.91</td><td>2.91</td></tr><tr><td>0.0</td><td>2.38</td><td>2.38</td><td>2.38</td></tr></table>		Output Voltage [V]	Load Current [A]			Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]	24.0	7.56	7.56	7.56	22.8	7.39	7.39	7.38	21.6	7.12	7.12	7.12	19.2	6.63	6.63	6.65	16.8	6.05	6.06	6.06	14.4	5.55	5.54	5.55	12.0	5.00	5.00	5.00	9.6	4.49	4.49	4.49	7.2	3.96	3.96	3.96	4.8	3.43	3.43	3.43	2.4	2.91	2.91	2.91	0.0	2.38	2.38	2.38
Output Voltage [V]	Load Current [A]																																																									
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 110[V]																																																							
24.0	7.56	7.56	7.56																																																							
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2.4	2.91	2.91	2.91																																																							
0.0	2.38	2.38	2.38																																																							

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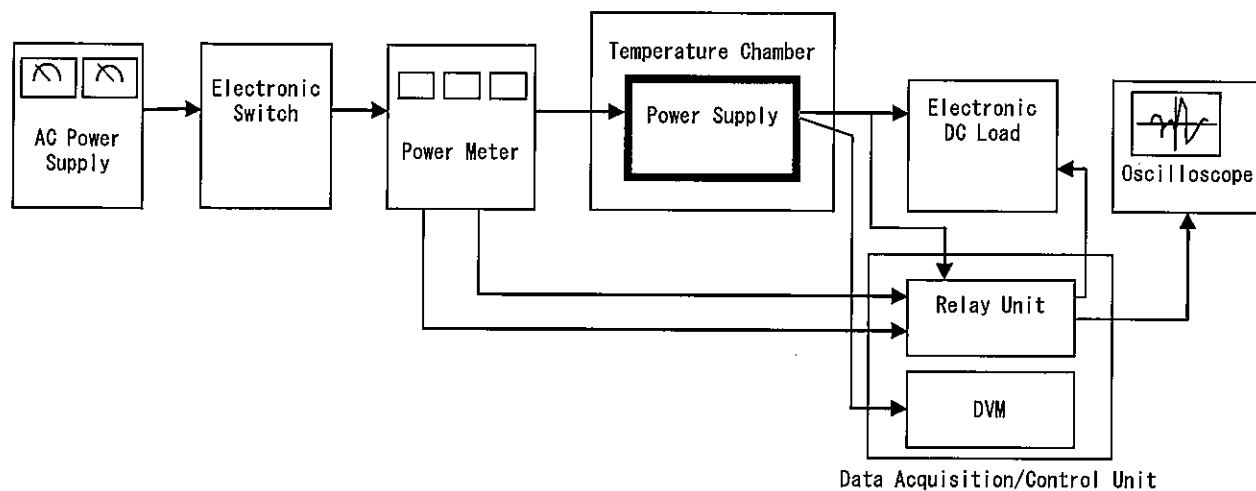


Figure A