

TEST DATA OF CHS3002405

Regulated DC Power Supply
June 24, 2015

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Yoshimichi Hirokawa Design Manager

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Tomomi Akai Design Engineer

COSEL CO.,LTD.



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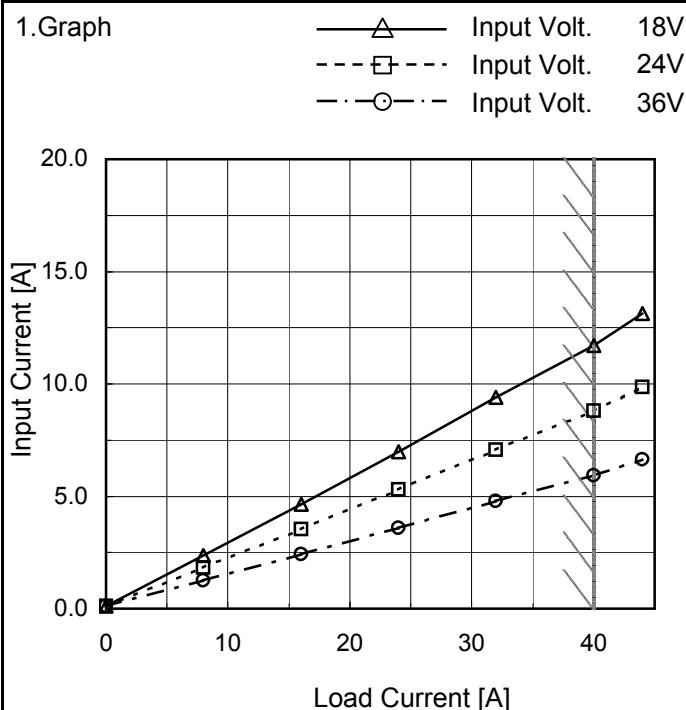
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Model	CHS3002405																																																																																																				
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Note: Slanted line shows the range of the rated input voltage.

Model	CHS3002405
Item	Input Current (by Load Current)
Object	_____



Temperature 25°C
Testing Circuitry Figure A

2. Values

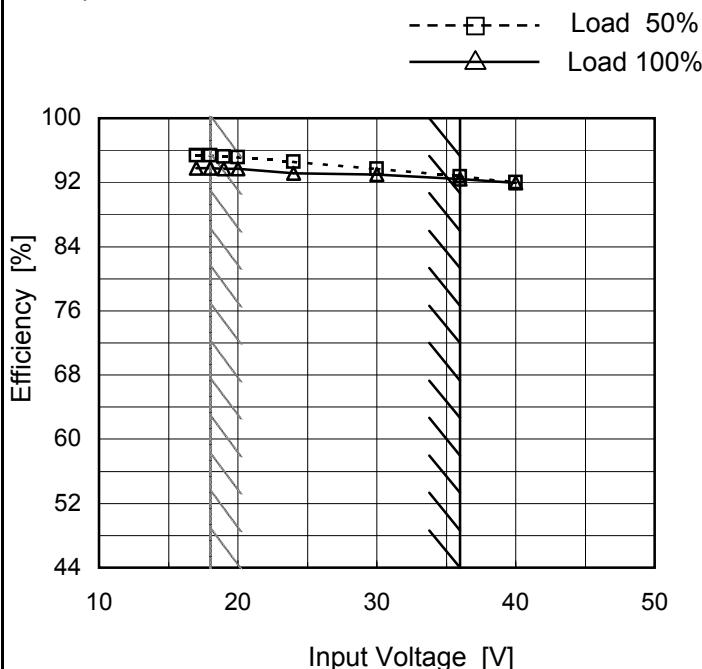
Load Current [A]	Input Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0	0.103	0.110	0.115
8	2.361	1.820	1.249
16	4.646	3.547	2.419
24	6.985	5.306	3.591
32	9.408	7.079	4.788
40	11.717	8.816	5.938
44	13.123	9.863	6.649
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Note: Slanted line shows the range of the rated load current.

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Model	CHS3002405	Temperature	25°C
Item	Efficiency (by Input Voltage)	Testing Circuitry	Figure A
Object	—		

1. Graph



Note: Slanted line shows the range of the rated input voltage.

2. Values

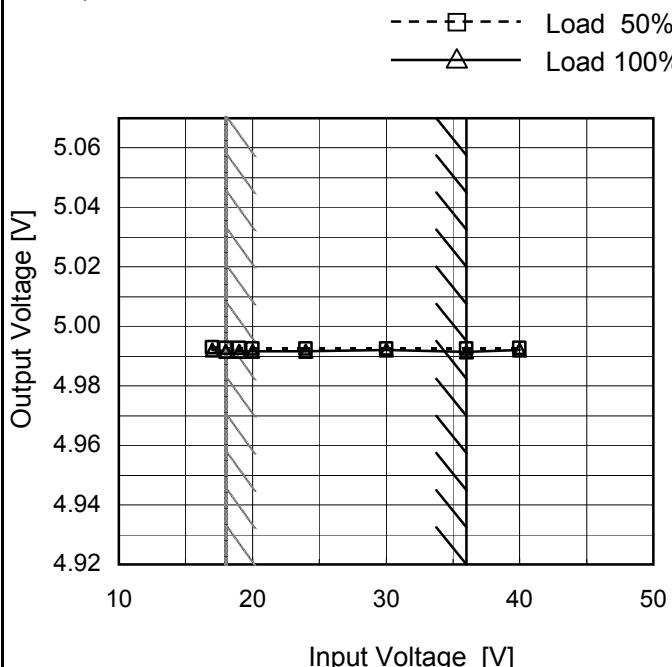
Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
17	95.4	93.7
18	95.4	93.8
19	95.2	93.7
20	95.1	93.7
24	94.6	93.2
30	93.7	93.0
36	92.7	92.4
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Model	CHS3002405	Temperature Testing Circuitry 25°C Figure A																																																					
Item	Efficiency (by Load Current)																																																						
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1.Graph	<p>Graph showing Efficiency [%] vs Load Current [A]. The Y-axis ranges from 44 to 100 in increments of 8. The X-axis ranges from 0 to 40 in increments of 10. Three data series are plotted: Input Volt. 18V (solid line with triangle markers), Input Volt. 24V (dashed line with square markers), and Input Volt. 36V (dash-dot line with circle markers). All curves show efficiency decreasing as load current increases beyond the rated range (indicated by a slanted line).</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Input Volt. 18V [%]</th> <th>Input Volt. 24V [%]</th> <th>Input Volt. 36V [%]</th> </tr> </thead> <tbody> <tr><td>0</td><td>94.0</td><td>92.3</td><td>89.3</td></tr> <tr><td>8</td><td>95.4</td><td>94.4</td><td>92.4</td></tr> <tr><td>16</td><td>95.1</td><td>94.5</td><td>92.8</td></tr> <tr><td>24</td><td>94.4</td><td>94.0</td><td>92.7</td></tr> <tr><td>32</td><td>93.8</td><td>93.2</td><td>92.4</td></tr> <tr><td>40</td><td>92.8</td><td>92.7</td><td>91.8</td></tr> </tbody> </table>	Load Current [A]	Input Volt. 18V [%]	Input Volt. 24V [%]	Input Volt. 36V [%]	0	94.0	92.3	89.3	8	95.4	94.4	92.4	16	95.1	94.5	92.8	24	94.4	94.0	92.7	32	93.8	93.2	92.4	40	92.8	92.7	91.8	2.Values																									
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Model	CHS3002405
Item	Line Regulation
Object	+5V40A

Temperature 25°C
Testing Circuitry Figure A

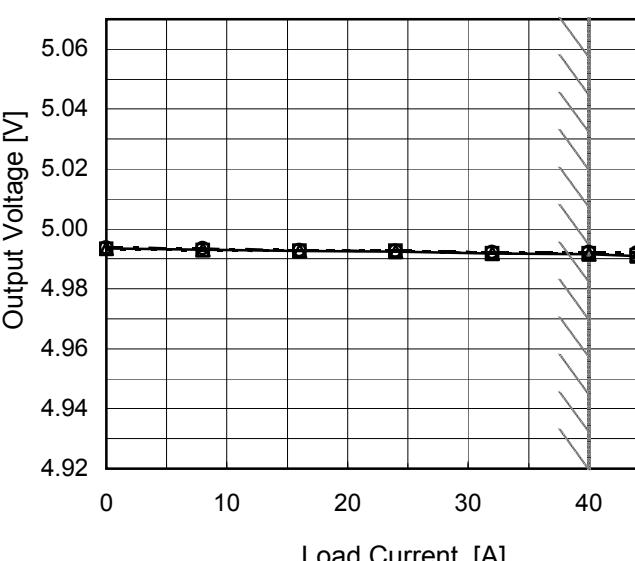
1. Graph



2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
17	4.993	4.992
18	4.993	4.992
19	4.993	4.992
20	4.993	4.992
24	4.993	4.992
30	4.993	4.992
36	4.993	4.992
40	4.993	4.992
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Note: Slanted line shows the range of the rated input voltage.

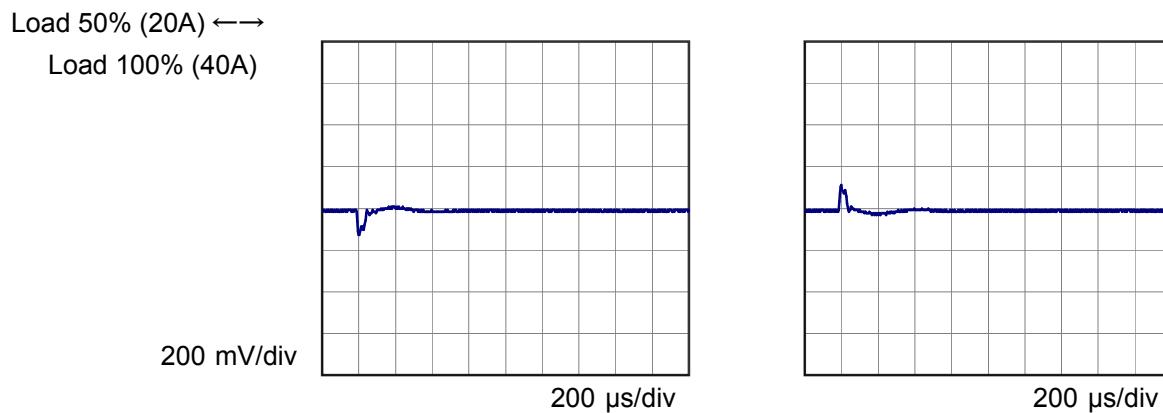
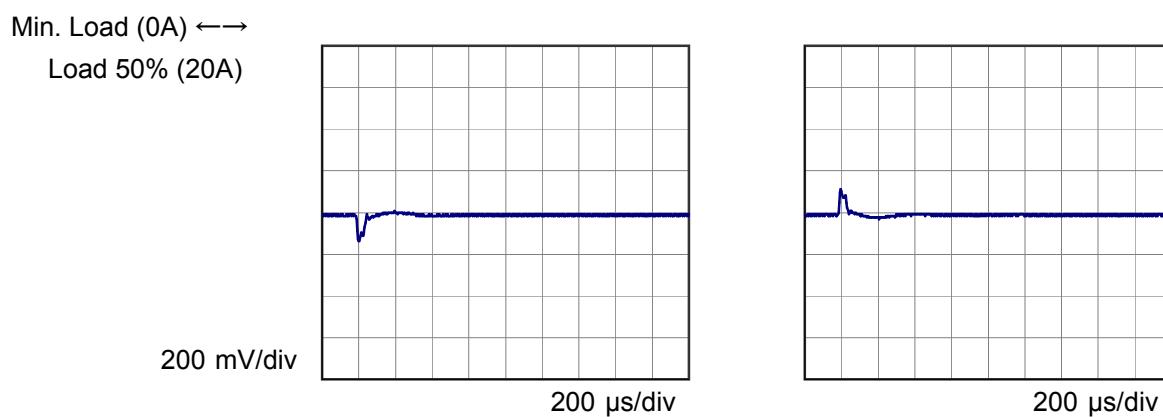
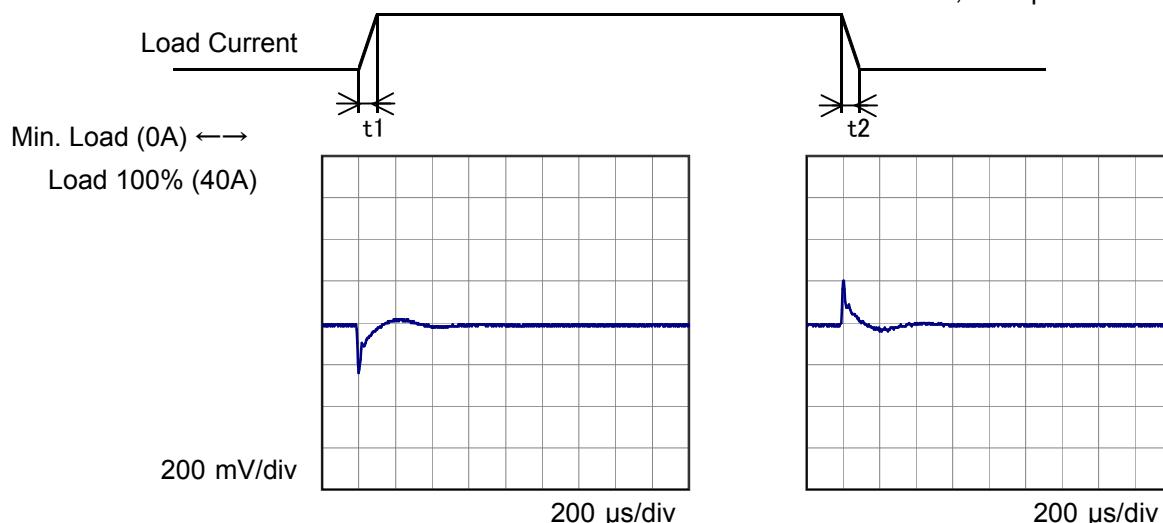
Model	CHS3002405	Temperature 25°C Testing Circuitry Figure A																																																					
Item	Load Regulation																																																						
Object	+5V40A																																																						
1.Graph	<p>—△— Input Volt. 18V - - -□- - Input Volt. 24V - - ○- - Input Volt. 36V</p>  <p>Output Voltage [V]</p> <p>Load Current [A]</p>	2.Values																																																					
		<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Output Voltage [V]</th> </tr> <tr> <th>Input Volt. 18[V]</th> <th>Input Volt. 24[V]</th> <th>Input Volt. 36[V]</th> </tr> </thead> <tbody> <tr><td>0</td><td>4.994</td><td>4.993</td><td>4.994</td></tr> <tr><td>8</td><td>4.993</td><td>4.993</td><td>4.994</td></tr> <tr><td>16</td><td>4.993</td><td>4.993</td><td>4.993</td></tr> <tr><td>24</td><td>4.993</td><td>4.993</td><td>4.993</td></tr> <tr><td>32</td><td>4.992</td><td>4.992</td><td>4.992</td></tr> <tr><td>40</td><td>4.992</td><td>4.992</td><td>4.992</td></tr> <tr><td>44</td><td>4.991</td><td>4.991</td><td>4.992</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> </tbody> </table>			Load Current [A]	Output Voltage [V]			Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	0	4.994	4.993	4.994	8	4.993	4.993	4.994	16	4.993	4.993	4.993	24	4.993	4.993	4.993	32	4.992	4.992	4.992	40	4.992	4.992	4.992	44	4.991	4.991	4.992	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Note: Slanted line shows the range of the rated load current.

COSEL

Model	CHS3002405	Temperature Testing Circuitry 25°C Figure A
Item	Dynamic Load Response	
Object	+5V40A	

Input Volt. 48 V
Cycle 5 ms

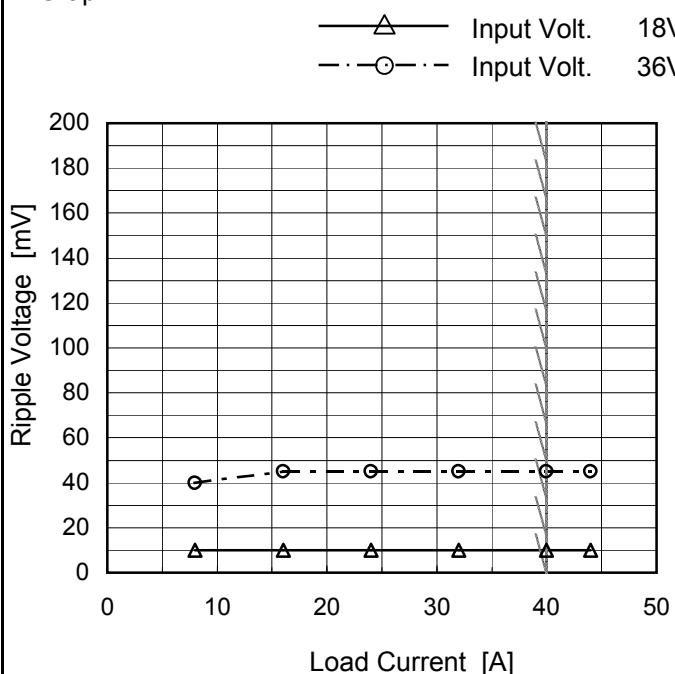




Model	CHS3002405
Item	Ripple Voltage (by Load Current)
Object	+5V40A

Temperature 25°C
Testing Circuitry Figure B

1. Graph



2. Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
8	10	40
16	10	45
24	10	45
32	10	45
40	10	45
44	10	45
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

Measured by 100 MHz Oscilloscope.

Ripple Voltage is shown as p-p in the figure below.

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

Ripple [mVp-p]

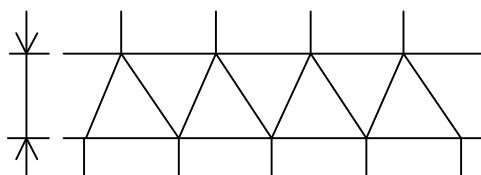
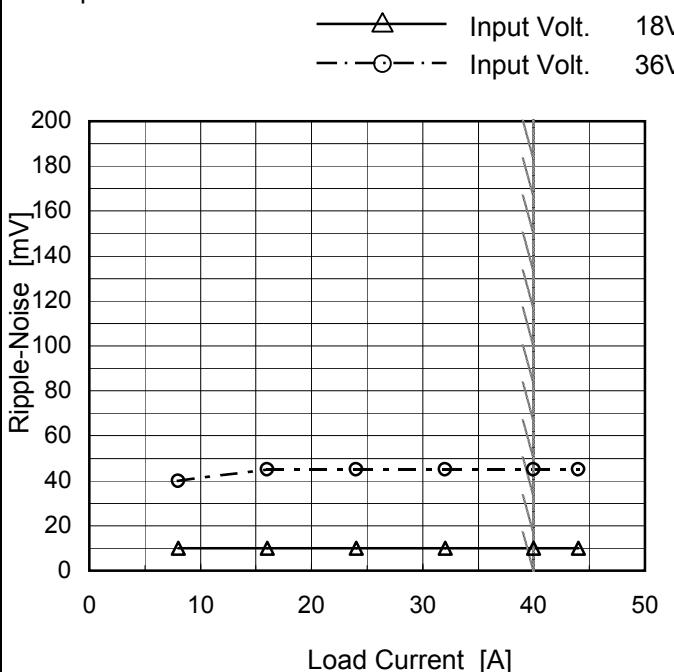


Fig.Complex Ripple Wave Form

COSEL

Model	CHS3002405
Item	Ripple-Noise
Object	+5V40A

1. Graph



Measured by 100 MHz Oscilloscope.

Ripple-Noise is shown as p-p in the figure below.

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

2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
8.0	10	40
16.0	10	45
24.0	10	45
32.0	10	45
40.0	10	45
44.0	10	45
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

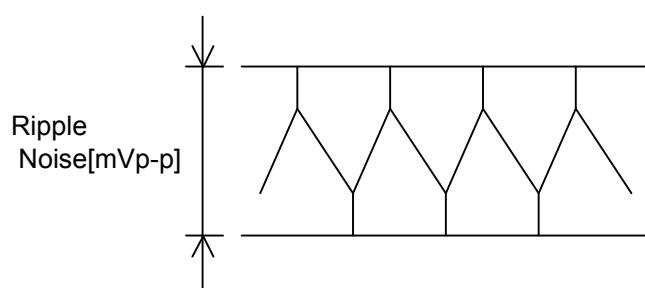
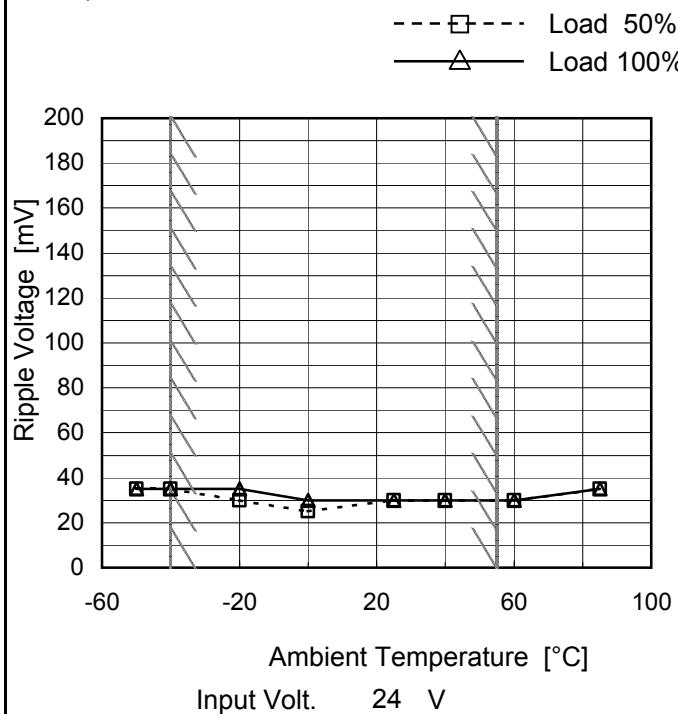


Fig.Complex Ripple Noise Wave Form

COSEL

Model	CHS3002405
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V40A

1. Graph



Measured by 100 MHz Oscilloscope.

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

Testing Circuitry Figure B

2. Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-50	35	35
-40	35	35
-20	30	35
0	25	30
25	30	30
40	30	30
60	30	30
85	35	35
--	-	-
--	-	-
--	-	-

Ripple [mVp-p]

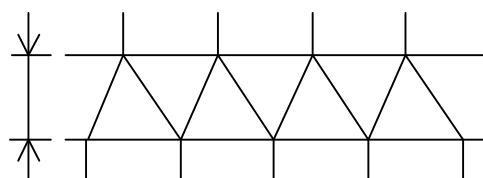
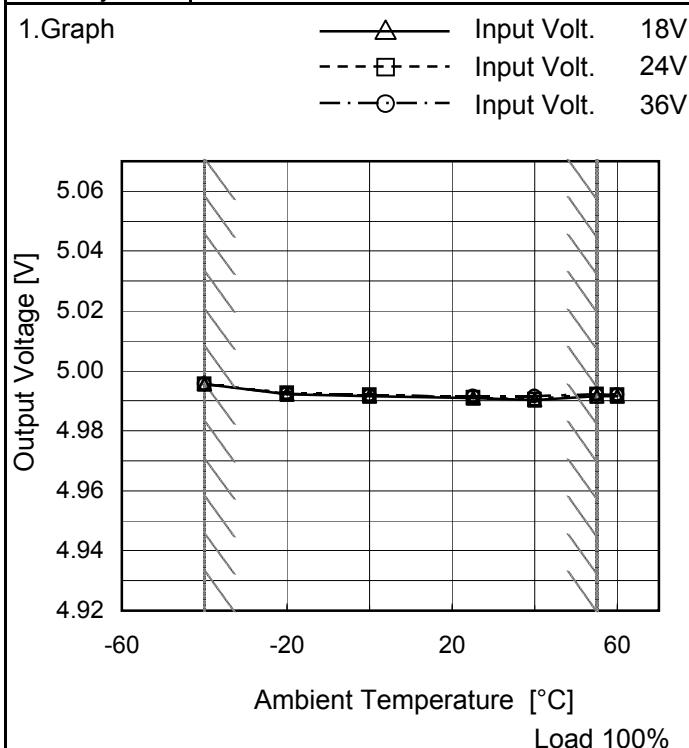


Fig. Complex Ripple Wave Form

Model	CHS3002405
Item	Ambient Temperature Drift
Object	+5V40A



Testing Circuitry Figure A

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt.	Input Volt.	Input Volt.
18[V]	24[V]	36[V]	
-40	4.996	4.996	4.996
-20	4.992	4.993	4.993
0	4.992	4.992	4.992
25	4.991	4.991	4.992
40	4.990	4.991	4.992
55	4.992	4.992	4.992
60	4.992	4.992	4.992
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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



Model	CHS3002405	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+5V40A	

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 : -40 - 55°C

Input Voltage : 18 - 36V

Load Current : 0 - 40A

* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

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

2. Values

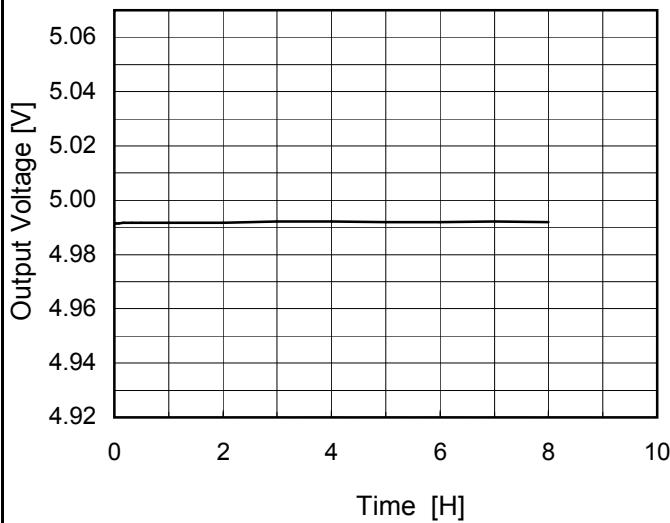
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-40	36	0	4.998	±4	±0.1
Minimum Voltage	40	18	40	4.990		

COSEL

Model	CHS3002405
Item	Time Lapse Drift
Object	+5V40A

Temperature 25°C
 Testing Circuitry Figure A

1. Graph



Input Volt. 24V
 Load 100%

2. Values

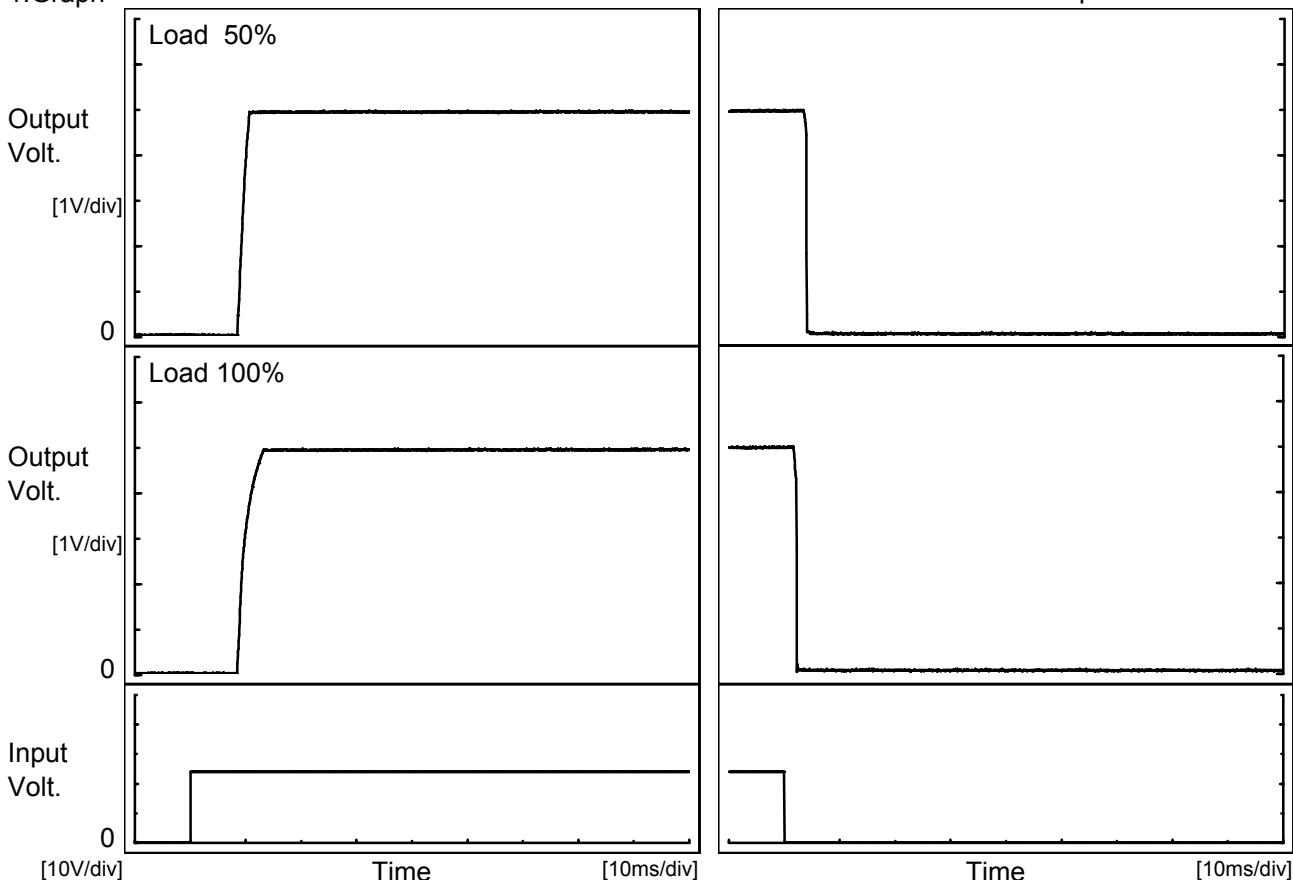
Time since start [H]	Output Voltage [V]
0.0	4.992
0.5	4.992
1.0	4.992
2.0	4.992
3.0	4.992
4.0	4.992
5.0	4.992
6.0	4.992
7.0	4.992
8.0	4.992

COSEL

Model	CHS3002405
Item	Rise and Fall Time
Object	+5V40A

Temperature 25°C
Testing Circuitry Figure A

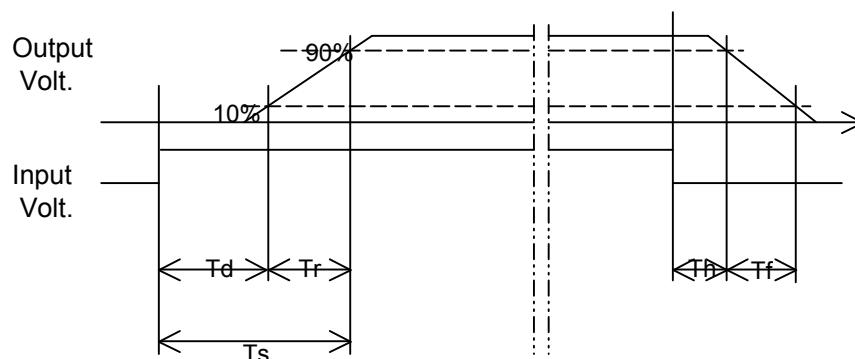
1. Graph



2. Values

[ms]

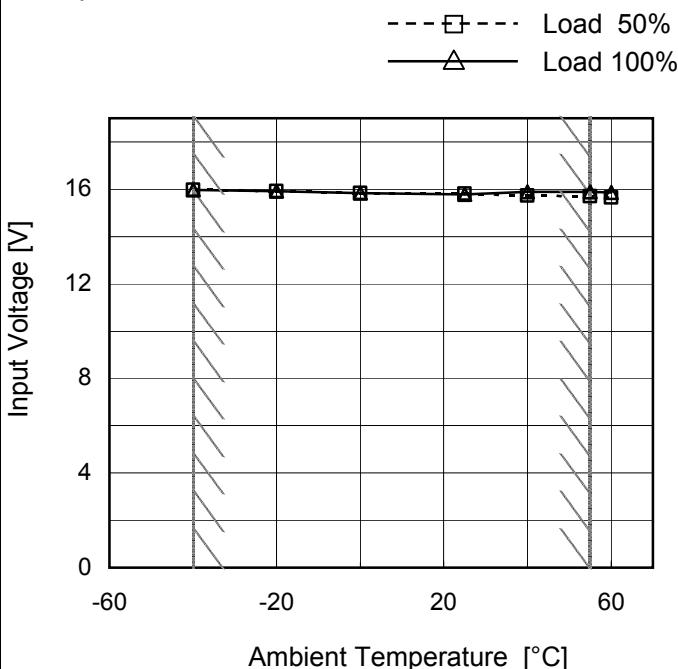
Load	Time	Td	Tr	Ts	Th	Tf
50 %		8.7	1.8	10.5	3.9	0.1
100 %		8.7	3.4	12.1	1.9	0.3



Model	CHS3002405
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+5V40A

Testing Circuitry Figure A

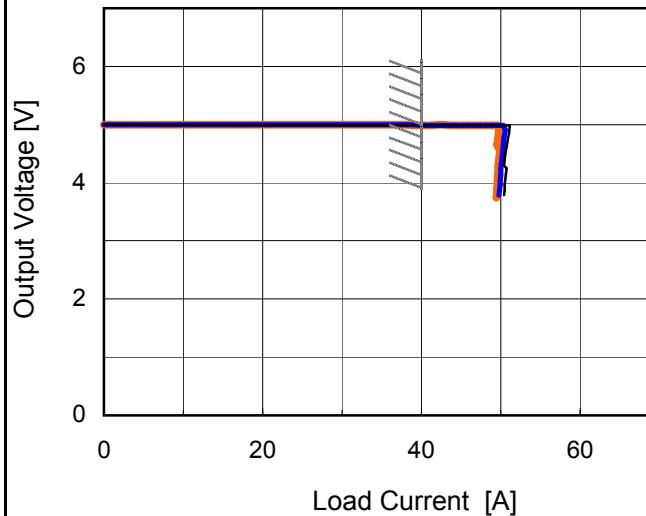
1.Graph



2.Values

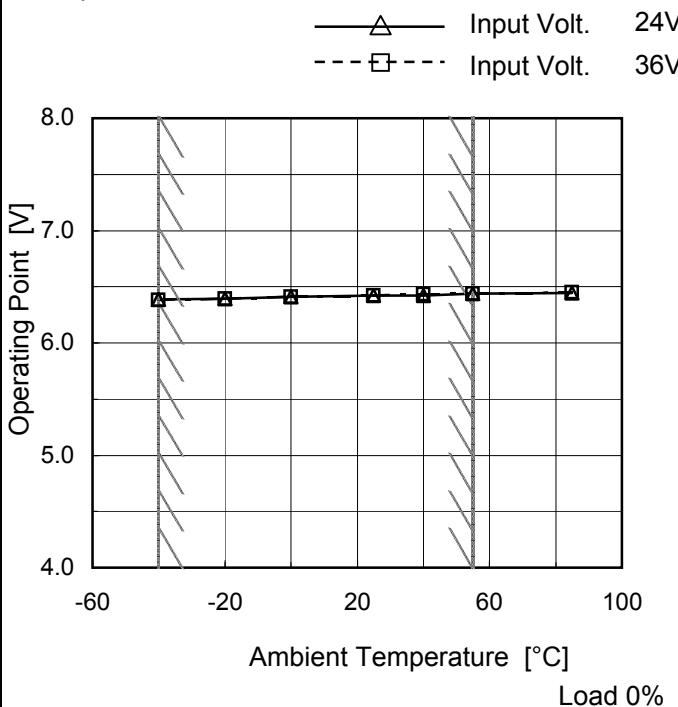
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-40	16.0	16.0
-20	16.0	16.0
0	15.9	15.9
25	15.9	15.8
40	15.8	15.9
55	15.7	15.9
60	15.7	15.9
--	-	-
--	-	-
--	-	-
--	-	-

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

Model	CHS3002405																																																																	
Item	Overcurrent Protection																																																																	
Object	+5V40A																																																																	
1.Graph																																																																		
 <p>The graph plots Output Voltage [V] on the Y-axis (0 to 6) against Load Current [A] on the X-axis (0 to 60). Three horizontal lines represent different input voltages: 18V (black), 24V (blue), and 36V (orange). A slanted line connects the points where the output voltage begins to drop from its rated value of approximately 5V. This slanted line defines the range of the rated load current.</p>																																																																		
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<table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="3">Load Current [A]</th> </tr> <tr> <th>Input Volt. 18[V]</th> <th>Input Volt. 24[V]</th> <th>Input Volt. 36[V]</th> </tr> </thead> <tbody> <tr><td>4.75</td><td>50.87</td><td>50.43</td><td>49.67</td></tr> <tr><td>4.50</td><td>50.57</td><td>50.21</td><td>49.91</td></tr> <tr><td>4.00</td><td>50.59</td><td>49.93</td><td>49.57</td></tr> <tr><td>3.50</td><td>50.40</td><td>49.79</td><td>49.46</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>				Output Voltage [V]	Load Current [A]			Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	4.75	50.87	50.43	49.67	4.50	50.57	50.21	49.91	4.00	50.59	49.93	49.57	3.50	50.40	49.79	49.46	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Model	CHS3002405
Item	Overvoltage Protection
Object	+5V40A

1. Graph



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

Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 24[V]	Input Volt. 36[V]
-40	6.39	6.38
-20	6.39	6.39
0	6.41	6.41
25	6.42	6.42
40	6.42	6.43
55	6.44	6.44
85	6.44	6.45
--	-	-
--	-	-
--	-	-
--	-	-

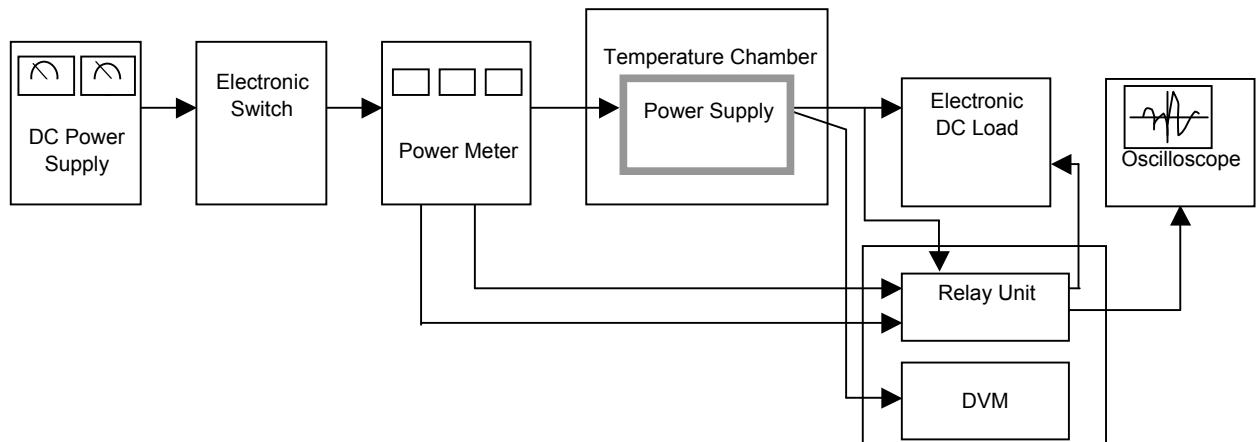


Figure A

Data Acquisition/Control Unit

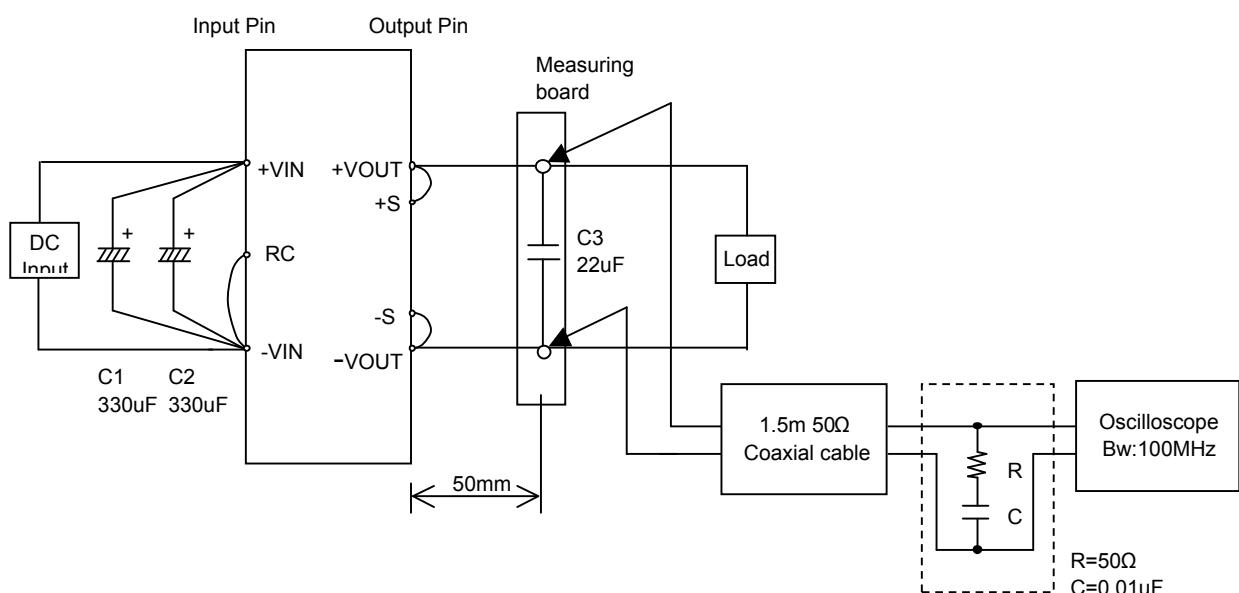


Figure B