

TEST DATA OF SUS1R5243R3

Regulated DC Power Supply
Sep 17, 2004

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Tetsuo Sugimori Design Manager

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COSEL CO.,LTD.



CONTENTS

1.Input Current (by Input Voltage)	1
2.Input Current (by Load Current)	2
3.Input Power (by Load Current)	3
4.Efficiency (by Input Voltage)	4
5.Efficiency (by Load 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.Minimum Input Voltage for Regulated Output Voltage	16
17.Overcurrent Protection	17
18.Figure of Testing Circuitry	18

(Final Page 18)

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Model	SUS1R5243R3																																																																							
Item	Input Current (by Input Voltage)																																																																							
Object	<p>1.Graph</p> <p>2.Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Input Voltage [V]</th> <th colspan="3">Input Current [A]</th> </tr> <tr> <th>Load 0%</th> <th>Load 50%</th> <th>Load 100%</th> </tr> </thead> <tbody> <tr><td>0</td><td>0.000</td><td>0.000</td><td>0.000</td></tr> <tr><td>4.0</td><td>0.000</td><td>0.000</td><td>0.000</td></tr> <tr><td>8.0</td><td>0.011</td><td>0.000</td><td>0.000</td></tr> <tr><td>8.4</td><td>0.010</td><td>0.151</td><td>0.135</td></tr> <tr><td>10.8</td><td>0.008</td><td>0.085</td><td>0.175</td></tr> <tr><td>12.0</td><td>0.008</td><td>0.076</td><td>0.150</td></tr> <tr><td>16.0</td><td>0.007</td><td>0.057</td><td>0.110</td></tr> <tr><td>18.0</td><td>0.007</td><td>0.051</td><td>0.097</td></tr> <tr><td>20.0</td><td>0.006</td><td>0.046</td><td>0.089</td></tr> <tr><td>24.0</td><td>0.006</td><td>0.040</td><td>0.074</td></tr> <tr><td>28.0</td><td>0.006</td><td>0.035</td><td>0.064</td></tr> <tr><td>32.0</td><td>0.006</td><td>0.031</td><td>0.057</td></tr> <tr><td>36.0</td><td>0.007</td><td>0.029</td><td>0.052</td></tr> <tr><td>40.0</td><td>0.007</td><td>0.027</td><td>0.048</td></tr> <tr><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>-</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>	Input Voltage [V]	Input Current [A]			Load 0%	Load 50%	Load 100%	0	0.000	0.000	0.000	4.0	0.000	0.000	0.000	8.0	0.011	0.000	0.000	8.4	0.010	0.151	0.135	10.8	0.008	0.085	0.175	12.0	0.008	0.076	0.150	16.0	0.007	0.057	0.110	18.0	0.007	0.051	0.097	20.0	0.006	0.046	0.089	24.0	0.006	0.040	0.074	28.0	0.006	0.035	0.064	32.0	0.006	0.031	0.057	36.0	0.007	0.029	0.052	40.0	0.007	0.027	0.048	-	-	-	-	-	-	-	-
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Note: Slanted line shows the range of the rated input voltage.

Temperature 25°C
Testing Circuitry Figure A

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0	0.000	0.000	0.000
4.0	0.000	0.000	0.000
8.0	0.011	0.000	0.000
8.4	0.010	0.151	0.135
10.8	0.008	0.085	0.175
12.0	0.008	0.076	0.150
16.0	0.007	0.057	0.110
18.0	0.007	0.051	0.097
20.0	0.006	0.046	0.089
24.0	0.006	0.040	0.074
28.0	0.006	0.035	0.064
32.0	0.006	0.031	0.057
36.0	0.007	0.029	0.052
40.0	0.007	0.027	0.048
-	-	-	-
-	-	-	-

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Model	SUS1R5243R3
Item	Input Current (by Load Current)
Object	<p>1.Graph</p> <p>—△— Input Volt. 18V ---□--- Input Volt. 24V ---○--- Input Volt. 36V</p> <p>Input Current [A]</p> <p>Load Current [A]</p>

 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]
0.00	0.007	0.006	0.007
0.08	0.024	0.020	0.016
0.16	0.043	0.033	0.025
0.24	0.061	0.047	0.034
0.32	0.080	0.060	0.043
0.40	0.098	0.075	0.052
0.44	0.108	0.082	0.057
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

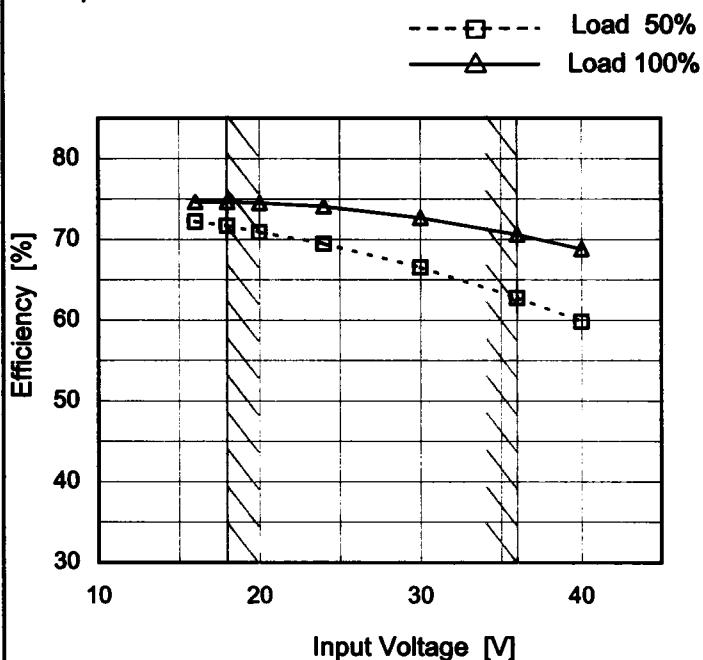
COSEL

Model	SUS1R5243R3	Temperature Testing Circuitry	25°C Figure A																																																			
Item	Input Power (by Load Current)																																																					
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Note:	Slanted line shows the range of the rated load current.																																																					



Model	SUS1R5243R3
Item	Efficiency (by Input Voltage)
Object	—

1.Graph



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

Temperature 25°C
Testing Circuitry Figure A

2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
16	72.2	74.6
18	71.7	74.7
20	70.9	74.5
24	69.5	74.1
30	66.5	72.7
36	62.7	70.6
40	59.8	68.8
—	-	-
—	-	-

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Model	SUS1R5243R3
Item	Efficiency (by Load Current)
Object	

1. Graph

Load Current [A]	Input Volt. 18V	Input Volt. 24V	Input Volt. 36V
0.00	-	-	-
0.08	60.9	57.1	46.8
0.16	69.8	67.3	59.7
0.24	73.0	71.3	65.5
0.32	74.4	73.3	68.8
0.40	74.9	74.4	70.8
0.44	75.0	74.6	71.5
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

 Temperature 25°C
 Testing Circuitry Figure A

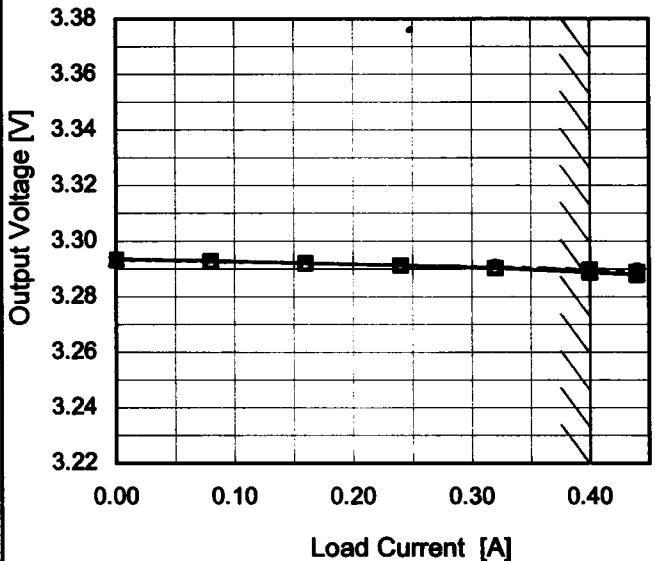
2. Values

Load Current [A]	Efficiency [%]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	-	-	-
0.08	60.9	57.1	46.8
0.16	69.8	67.3	59.7
0.24	73.0	71.3	65.5
0.32	74.4	73.3	68.8
0.40	74.9	74.4	70.8
0.44	75.0	74.6	71.5
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	SUS1R5243R3																																	
Item	Line Regulation	Temperature 25°C Testing Circuitry Figure A																																
Object	+3.3V0.4A																																	
1.Graph																																		
<p style="text-align: center;">--- □ --- Load 50% — △ — Load 100%</p>																																		
<p style="text-align: center;">Output Voltage [V]</p> <p style="text-align: center;">Input Voltage [V]</p>																																		
<p>Note: Slanted line shows the range of the rated input voltage.</p>																																		
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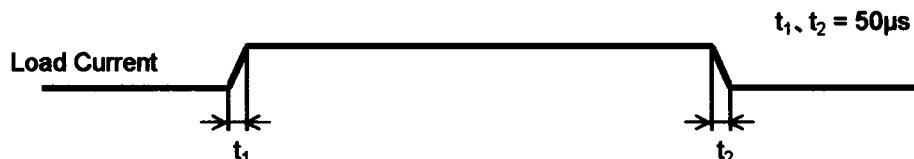
Model	SUS1R5243R3	Temperature 25°C	
Item	Load Regulation	Testing Circuitry Figure A	
Object	+3.3V0.4A		
1.Graph			
<p style="text-align: center;"> Input Volt. 18V Input Volt. 24V Input Volt. 36V </p> 			
<p>Note: Slanted line shows the range of the rated load current.</p>			
2.Values			
Load Current [A]	Output Voltage [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	3.294	3.293	3.294
0.08	3.293	3.293	3.293
0.16	3.292	3.292	3.292
0.24	3.291	3.291	3.291
0.32	3.291	3.290	3.291
0.40	3.289	3.290	3.290
0.44	3.288	3.289	3.289
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

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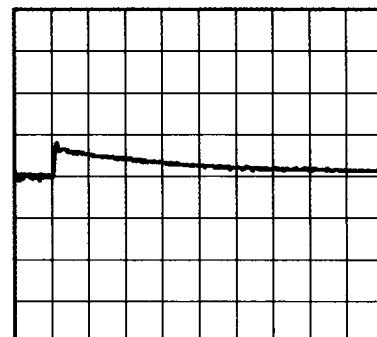
Model SUS1R5243R3

Item Dynamic Load Response

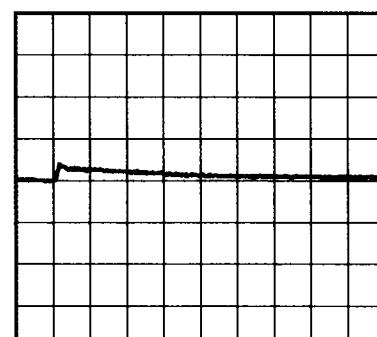
Object +3.3V0.4A

Temperature 25°C
Testing Circuitry Figure AInput Volt. 24 V
Cycle 100 mSMin. Load (0A) \longleftrightarrow
Load 100% (0.4A)

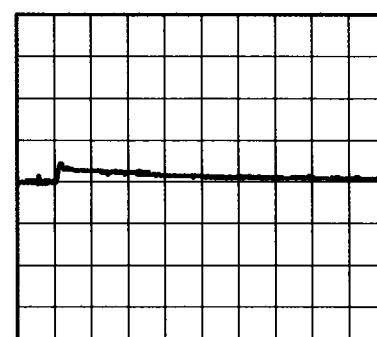
100mV/div

Min. Load (0A) \longleftrightarrow
Load 50% (0.2A)

100mV/div

Load 50% (0.2A) \longleftrightarrow
Load 100% (0.4A)

100mV/div



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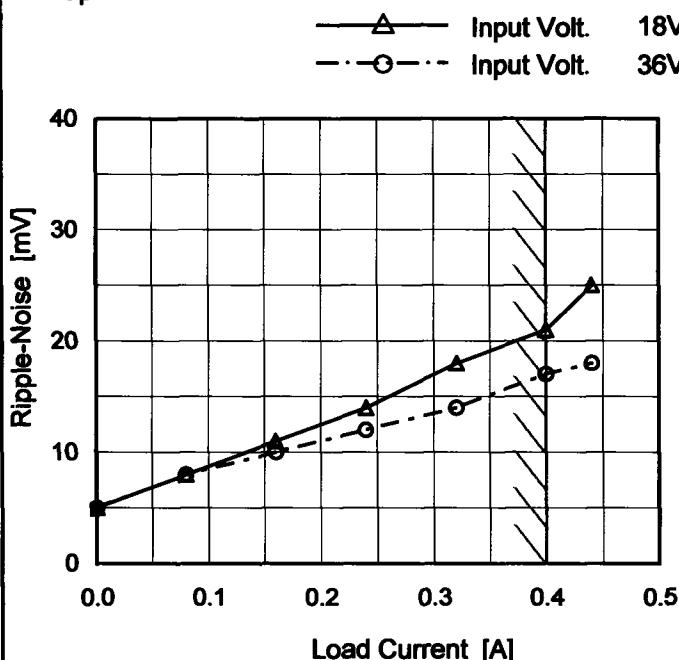
Model	SUS1R5243R3																																							
Item	Ripple Voltage (by Load Current)	Temperature 25°C Testing Circuitry Figure B																																						
Object	+3.3V0.4A																																							
1. Graph																																								
<p>Graph showing Ripple Voltage [mV] vs Load Current [A]. The Y-axis ranges from 0 to 40 mV, and the X-axis ranges from 0.0 to 0.5 A. Two curves are plotted: one for Input Volt. 18V (solid line with triangle markers) and one for Input Volt. 36V (dashed line with circle markers). Both curves show an increase in ripple voltage as load current increases. A slanted line is drawn through the data points, indicating the range of the rated load current.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Ripple Voltage [mV] (Input Volt. 18V)</th> <th>Ripple Voltage [mV] (Input Volt. 36V)</th> </tr> </thead> <tbody> <tr><td>0.00</td><td>3</td><td>4</td></tr> <tr><td>0.08</td><td>5</td><td>4</td></tr> <tr><td>0.16</td><td>6</td><td>4</td></tr> <tr><td>0.24</td><td>8</td><td>6</td></tr> <tr><td>0.32</td><td>13</td><td>8</td></tr> <tr><td>0.40</td><td>19</td><td>10</td></tr> <tr><td>0.44</td><td>23</td><td>11</td></tr> </tbody> </table>			Load Current [A]	Ripple Voltage [mV] (Input Volt. 18V)	Ripple Voltage [mV] (Input Volt. 36V)	0.00	3	4	0.08	5	4	0.16	6	4	0.24	8	6	0.32	13	8	0.40	19	10	0.44	23	11														
Load Current [A]	Ripple Voltage [mV] (Input Volt. 18V)	Ripple Voltage [mV] (Input Volt. 36V)																																						
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Load Current [A]	Ripple Voltage [mV]																																							
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<p>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.</p> <p>Ripple [mVp-p]</p> <p>Fig.Complex Ripple Wave Form</p>																																								

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Model	SUS1R5243R3
Item	Ripple-Noise
Object	+3.3V0.4A

Temperature 25°C
Testing Circuitry Figure B

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]
0.00	5	5
0.08	8	8
0.16	11	10
0.24	14	12
0.32	18	14
0.40	21	17
0.44	25	18
-	-	-
-	-	-
-	-	-
-	-	-

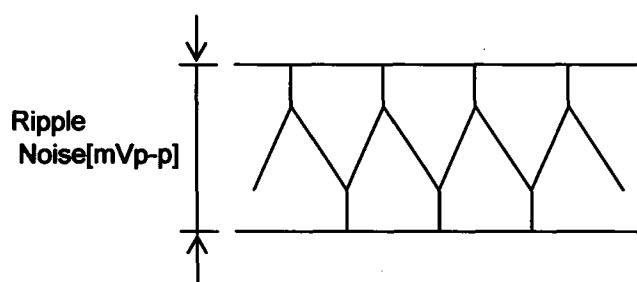
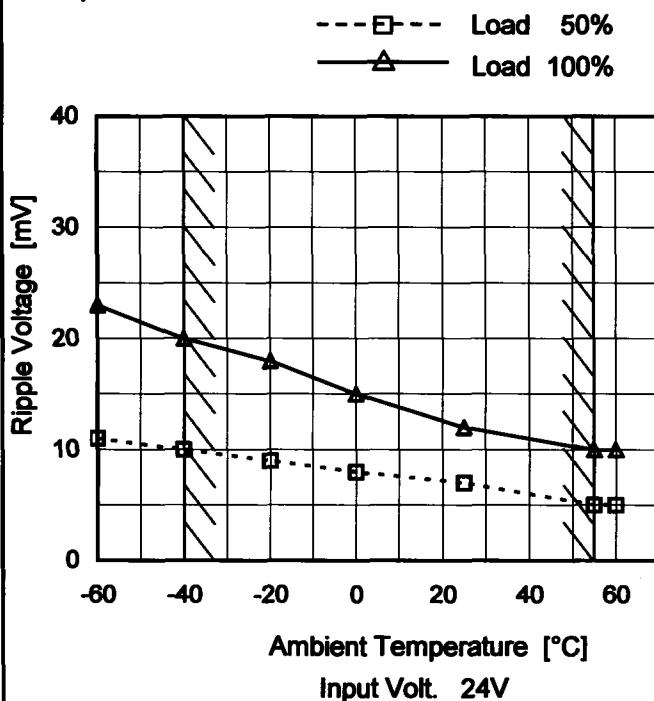


Fig.Complex Ripple Noise Wave Form

COSEL

Model	SUS1R5243R3
Item	Ripple Voltage (by Ambient Temp.)
Object	+3.3V0.4A

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%
-60	11	23
-40	10	20
-20	9	18
0	8	15
25	7	12
55	5	10
60	5	10
-	-	-
-	-	-
-	-	-
-	-	-

COSEL

Model	SUS1R5243R3																																															
Item	Ambient Temperature Drift																																															
Object	+3.3V0.4A																																															
1.Graph	—▲— Input Volt. 18V ---□--- Input Volt. 24V ---○--- Input Volt. 36V	Output Voltage [V]	2.Values																																													
<p>The graph plots Output Voltage [V] on the y-axis (3.22 to 3.38) against Ambient Temperature [°C] on the x-axis (-60 to 60). Three data series are shown for input voltages of 18V, 24V, and 36V. All series show a slight positive slope. A slanted line is drawn through the data points, representing the rated ambient temperature range from -40°C to 60°C.</p> <table border="1"> <thead> <tr> <th>Ambient Temperature [°C]</th> <th>18[V]</th> <th>24[V]</th> <th>36[V]</th> </tr> </thead> <tbody> <tr><td>-60</td><td>3.260</td><td>3.262</td><td>3.263</td></tr> <tr><td>-40</td><td>3.271</td><td>3.273</td><td>3.273</td></tr> <tr><td>-20</td><td>3.279</td><td>3.281</td><td>3.281</td></tr> <tr><td>0</td><td>3.286</td><td>3.287</td><td>3.287</td></tr> <tr><td>25</td><td>3.290</td><td>3.291</td><td>3.291</td></tr> <tr><td>55</td><td>3.293</td><td>3.293</td><td>3.294</td></tr> <tr><td>60</td><td>3.292</td><td>3.293</td><td>3.294</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>	Ambient Temperature [°C]	18[V]	24[V]	36[V]	-60	3.260	3.262	3.263	-40	3.271	3.273	3.273	-20	3.279	3.281	3.281	0	3.286	3.287	3.287	25	3.290	3.291	3.291	55	3.293	3.293	3.294	60	3.292	3.293	3.294	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ambient Temperature [°C]	18[V]	24[V]	36[V]																																													
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-20	3.279	3.281	3.281																																													
0	3.286	3.287	3.287																																													
25	3.290	3.291	3.291																																													
55	3.293	3.293	3.294																																													
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<p>Note: Slanted line shows the range of the rated ambient temperature.</p>			Testing Circuitry Figure A																																													



Model	SUS1R5243R3	Testing Circuitry Figure A
Item	Output Voltage Accuracy	
Object	+3.3V0.4A	

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 - 0.4A

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

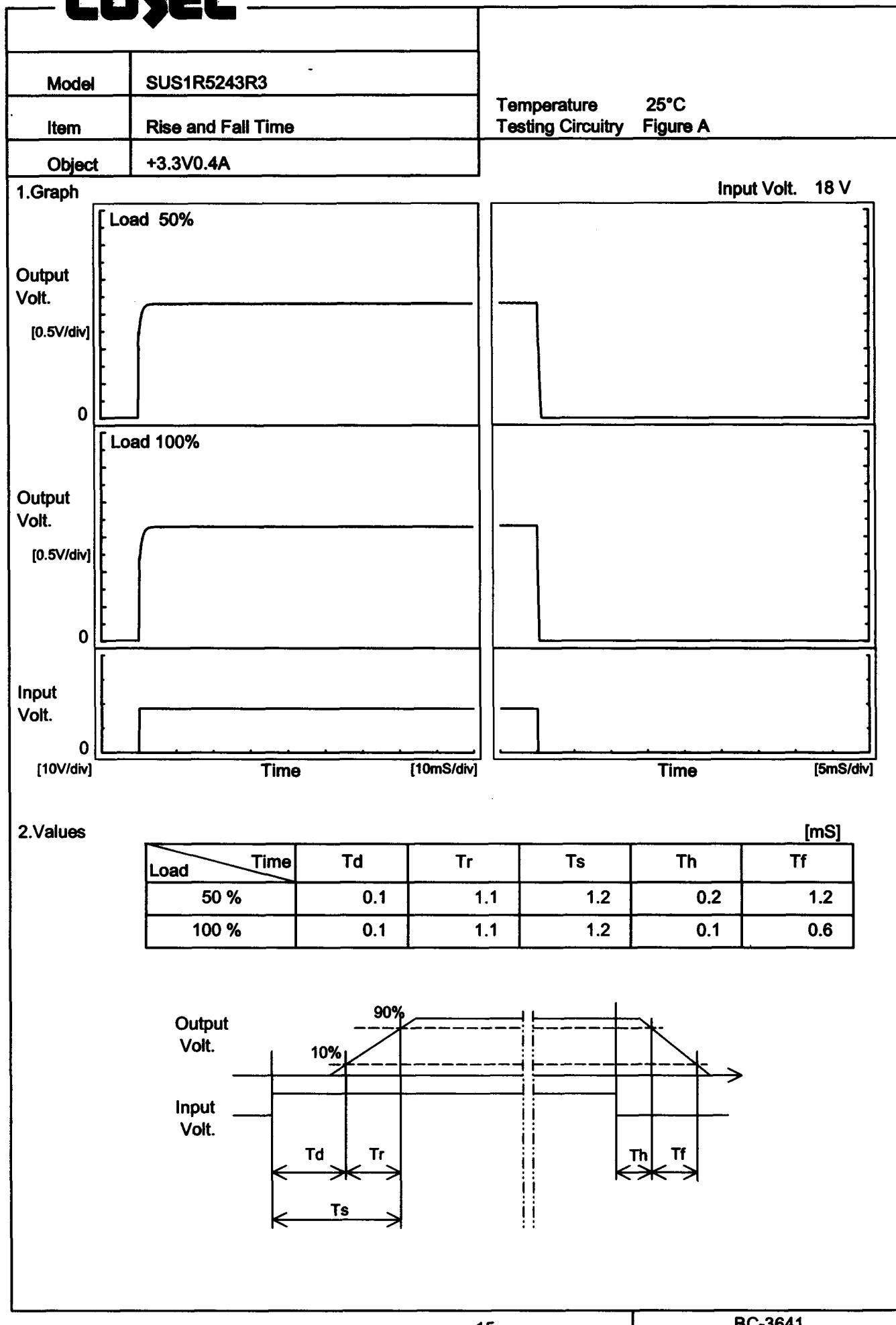
$$\text{* Output Voltage Accuracy (Ratio) } = \frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$$

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	55	36	0	3.297	± 13	± 0.4
Minimum Voltage	-40	18	0.4	3.271		

COSEL

Model	SUS1R5243R3	Temperature	25°C																						
Item	Time Lapse Drift	Testing Circuitry	Figure A																						
Object	+3.3V0.4A																								
1.Graph			2.Values																						
<p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 24V 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>3.296</td></tr> <tr><td>0.5</td><td>3.298</td></tr> <tr><td>1.0</td><td>3.298</td></tr> <tr><td>2.0</td><td>3.297</td></tr> <tr><td>3.0</td><td>3.297</td></tr> <tr><td>4.0</td><td>3.297</td></tr> <tr><td>5.0</td><td>3.298</td></tr> <tr><td>6.0</td><td>3.298</td></tr> <tr><td>7.0</td><td>3.299</td></tr> <tr><td>8.0</td><td>3.298</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	3.296	0.5	3.298	1.0	3.298	2.0	3.297	3.0	3.297	4.0	3.297	5.0	3.298	6.0	3.298	7.0	3.299	8.0	3.298
Time since start [H]	Output Voltage [V]																								
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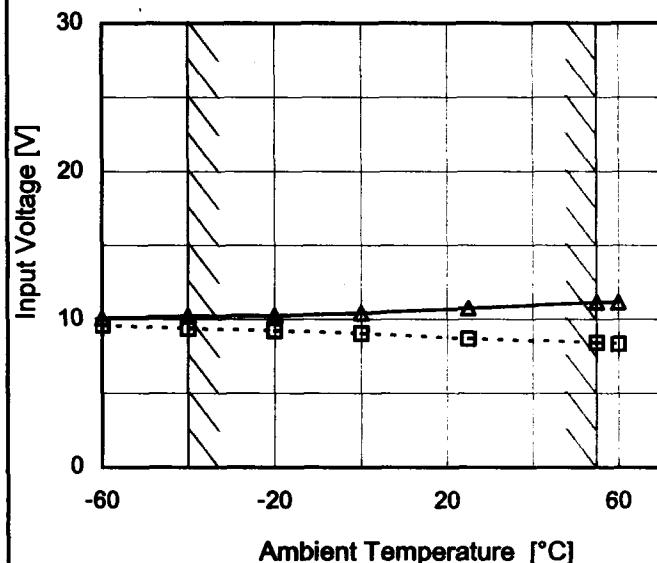
COSEL

COSEL

Model	SUS1R5243R3
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+3.3V0.4A

1. Graph

---□--- Load 50%
—△— Load 100%



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%
-60	9.6	10.1
-40	9.4	10.3
-20	9.3	10.3
0	9.1	10.5
25	8.7	10.8
55	8.5	11.2
60	8.4	11.2
-	-	-
-	-	-
-	-	-
-	-	-

COSEL

Model	SUS1R5243R3	Temperature	25°C																																																							
Item	Overcurrent Protection	Testing Circuitry	Figure A																																																							
Object	+3.3V0.4A																																																									
1.Graph	<p>Input Volt. 18V Input Volt. 24V Input Volt. 36V</p> <p>The graph plots Output Voltage [V] on the Y-axis (0.0 to 4.0) against Load Current [A] on the X-axis (0.0 to 1.2). Three curves are shown for different input voltages: 18V (top), 24V (middle), and 36V (bottom). All curves show a steep initial drop in output voltage as load current increases from 0 to approximately 0.8A, after which the rate of voltage drop decreases. A slanted line is drawn across the graph, starting at approximately (0.35A, 3.3V) and ending at approximately (0.85A, 0.4V), indicating the range of the rated load current.</p>																																																									
2.Values	<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>3.30</td><td>0.40</td><td>0.40</td><td>0.40</td></tr> <tr><td>3.14</td><td>0.64</td><td>0.62</td><td>0.57</td></tr> <tr><td>2.97</td><td>0.66</td><td>0.64</td><td>0.58</td></tr> <tr><td>2.64</td><td>0.69</td><td>0.67</td><td>0.61</td></tr> <tr><td>2.31</td><td>0.73</td><td>0.70</td><td>0.64</td></tr> <tr><td>1.98</td><td>0.77</td><td>0.74</td><td>0.67</td></tr> <tr><td>1.65</td><td>0.82</td><td>0.77</td><td>0.70</td></tr> <tr><td>1.32</td><td>0.86</td><td>0.79</td><td>0.72</td></tr> <tr><td>0.99</td><td>0.89</td><td>0.82</td><td>0.74</td></tr> <tr><td>0.66</td><td>0.92</td><td>0.83</td><td>0.75</td></tr> <tr><td>0.33</td><td>0.94</td><td>0.83</td><td>0.77</td></tr> <tr><td>0.00</td><td>0.99</td><td>0.87</td><td>0.83</td></tr> </tbody> </table>			Output Voltage [V]	Load Current [A]			Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]	3.30	0.40	0.40	0.40	3.14	0.64	0.62	0.57	2.97	0.66	0.64	0.58	2.64	0.69	0.67	0.61	2.31	0.73	0.70	0.64	1.98	0.77	0.74	0.67	1.65	0.82	0.77	0.70	1.32	0.86	0.79	0.72	0.99	0.89	0.82	0.74	0.66	0.92	0.83	0.75	0.33	0.94	0.83	0.77	0.00	0.99	0.87	0.83
Output Voltage [V]	Load Current [A]																																																									
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Note: Slanted line shows the range of the rated load current.

COSEL

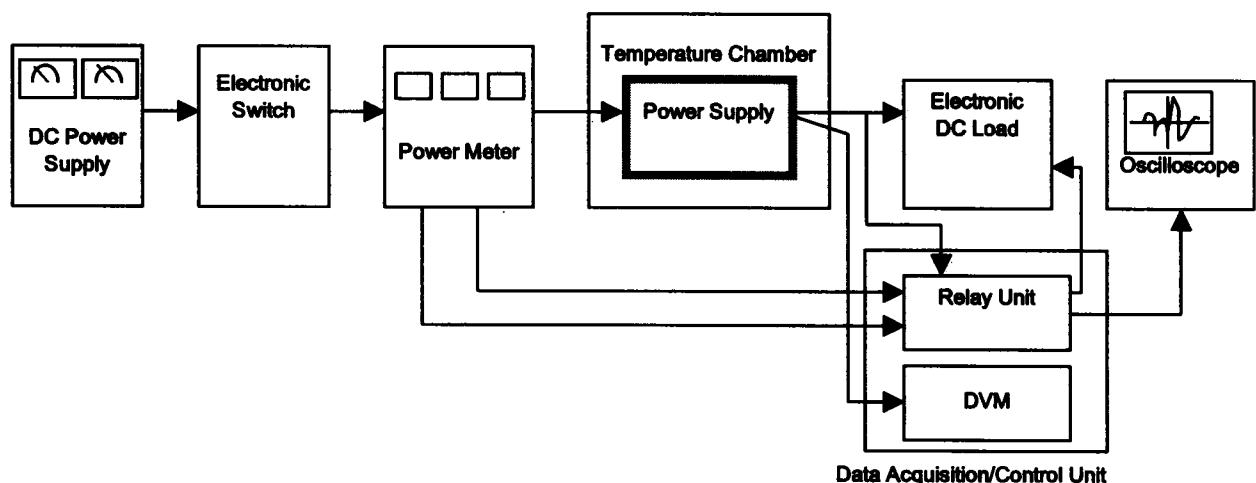


Figure A

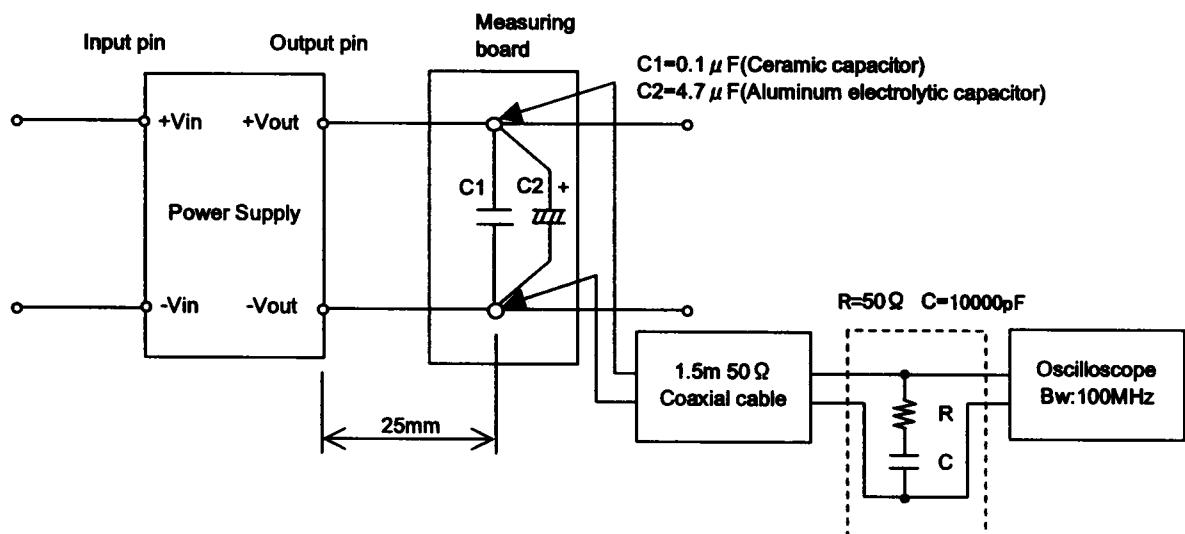


Figure B (Ripple and Ripple noise Characteristic)