

# TEST DATA OF MMC100B-4

Regulated DC Power Supply  
April 7, 2011

Approved by : Naoki Tonami  
Naoki Tonami Design Manager

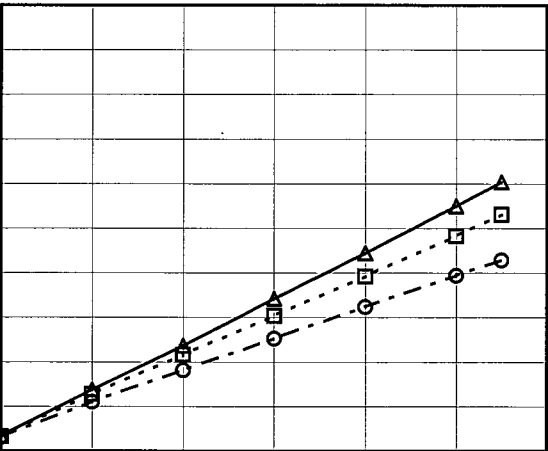
Prepared by : Hironobu Shimizu  
Hironobu Shimizu Design Engineer

**COSEL CO.,LTD.**

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Model		MMC100B-4																																																		
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<div><div><div>—△—</div><div>Input Volt.</div><div>85V</div></div><div><div>- - -□- -</div><div>Input Volt.</div><div>100V</div></div><div><div>- · -○- ·</div><div>Input Volt.</div><div>132V</div></div></div> <div><div><div>5.0</div><div>4.0</div><div>3.0</div><div>2.0</div><div>1.0</div><div>0.0</div></div><div><div>0</div><div>40</div><div>80</div><div>120</div></div><div><div>Input Current [A]</div><div>Load Ration [%]</div></div></div> <div><table><tr><th rowspan="2">Load Ration [%]</th><th colspan="3">Input Current [A]</th></tr><tr><th>Input Volt. 85[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 132[V]</th></tr><tr><td>0</td><td>0.174</td><td>0.164</td><td>0.154</td></tr><tr><td>20</td><td>0.689</td><td>0.640</td><td>0.552</td></tr><tr><td>40</td><td>1.187</td><td>1.080</td><td>0.907</td></tr><tr><td>60</td><td>1.712</td><td>1.519</td><td>1.265</td></tr><tr><td>80</td><td>2.225</td><td>1.963</td><td>1.620</td></tr><tr><td>100</td><td>2.750</td><td>2.414</td><td>1.971</td></tr><tr><td>110</td><td>3.020</td><td>2.653</td><td>2.143</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></div> <div><div>-</div><div>1</div><div>-</div></div> <div>BC-10559</div>		Load Ration [%]	Input Current [A]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0	0.174	0.164	0.154	20	0.689	0.640	0.552	40	1.187	1.080	0.907	60	1.712	1.519	1.265	80	2.225	1.963	1.620	100	2.750	2.414	1.971	110	3.020	2.653	2.143	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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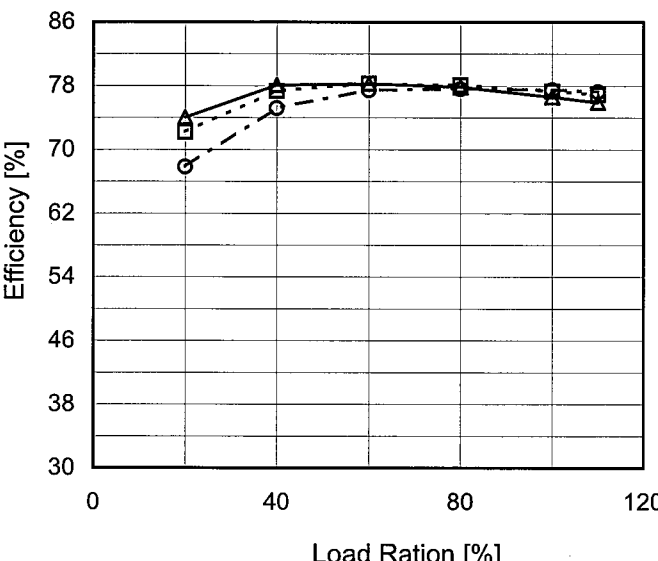
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80	0.545	0.524	0.484																																																							
100	0.561	0.538	0.498																																																							
110	0.567	0.542	0.505																																																							
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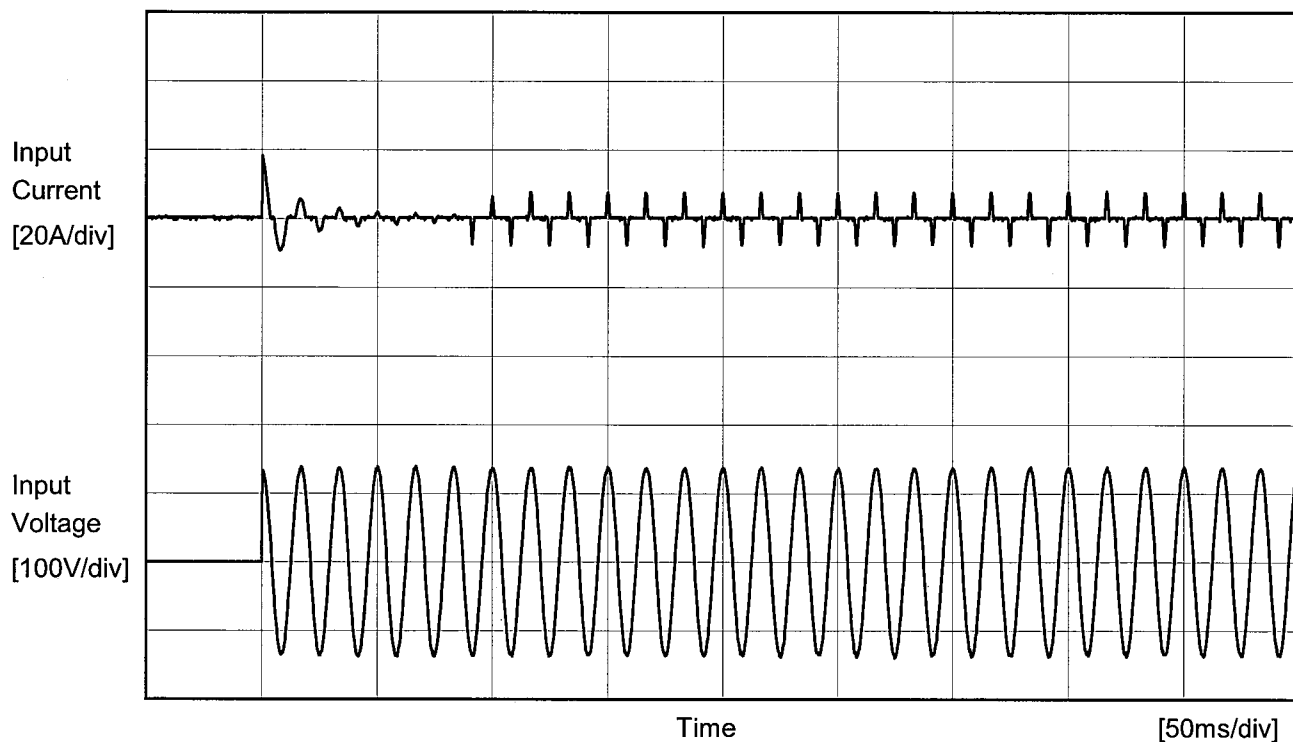
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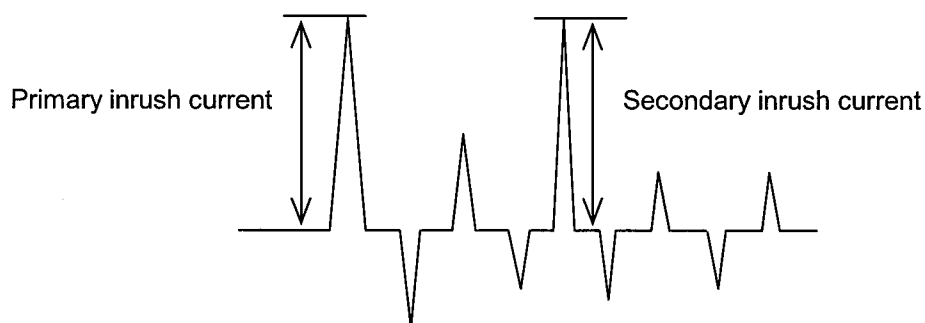


Model	MMC100B-4	Temperature 25°C Testing Circuitry Figure A	
Item	Inrush Current		
Object	_____		



Input Voltage 100 V  
Frequency 60 Hz  
Load 100 %

Primary inrush current 18.1 A  
Secondary inrush current 8.3 A





Model		MMC100B-4	Temperature 25°C Testing Circuitry Figure B
Item		Leakage Current	
Object			

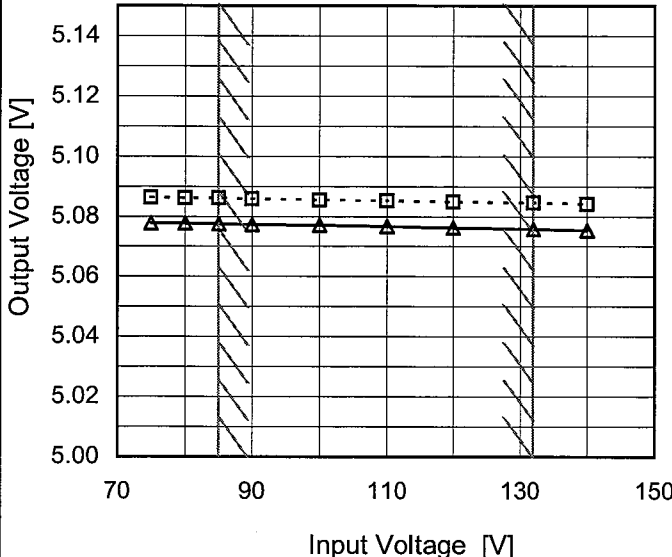
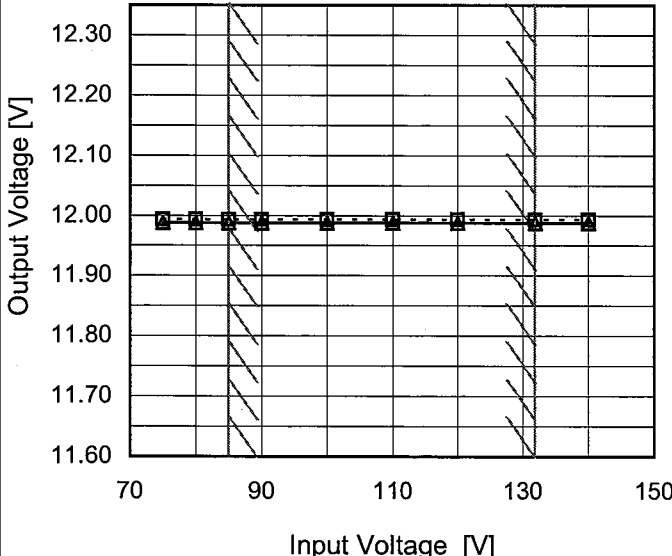
## 1.Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A)DEN-AN	0.15	0.18	0.22
(B)IEC60950-1	0.15	0.19	0.25

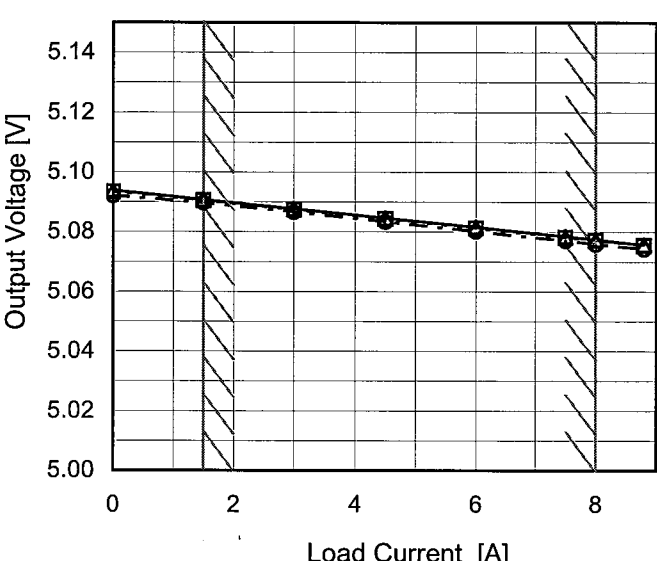
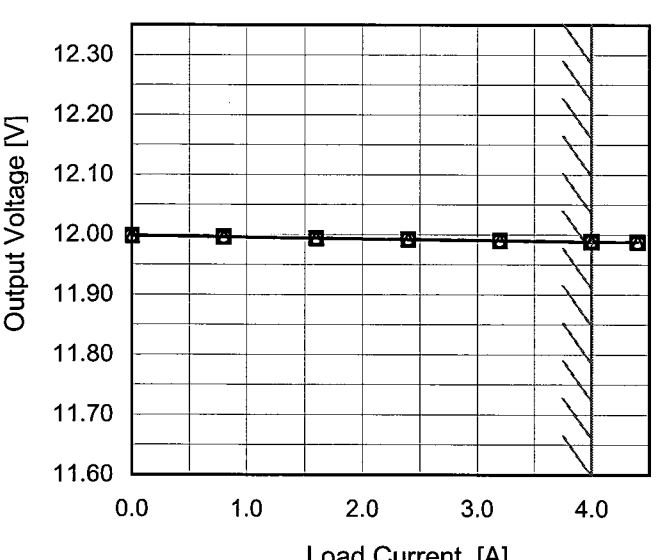
Standards	Leakage Current [mA]		
	Input Volt. 170 [V]	Input Volt. 230 [V]	Input Volt. 264 [V]
(B)IEC60950-1	-	-	-

## 2.Condition

Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

Model	MMC100B-4																																		
Item	Line Regulation	Temperature	25°C																																
Object	+5V8A	Testing Circuitry	Figure A																																
1.Graph		2.Values																																	
<div><div>---□--- Load 50%</div><div>—△— Load 100%</div></div>		<table><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><tr><td>75</td><td>5.086</td><td>5.078</td></tr><tr><td>80</td><td>5.086</td><td>5.078</td></tr><tr><td>85</td><td>5.086</td><td>5.078</td></tr><tr><td>90</td><td>5.086</td><td>5.077</td></tr><tr><td>100</td><td>5.086</td><td>5.077</td></tr><tr><td>110</td><td>5.085</td><td>5.077</td></tr><tr><td>120</td><td>5.085</td><td>5.076</td></tr><tr><td>132</td><td>5.085</td><td>5.076</td></tr><tr><td>140</td><td>5.084</td><td>5.076</td></tr></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	75	5.086	5.078	80	5.086	5.078	85	5.086	5.078	90	5.086	5.077	100	5.086	5.077	110	5.085	5.077	120	5.085	5.076	132	5.085	5.076	140	5.084	5.076
Input Voltage [V]	Output Voltage [V]																																		
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Input Voltage [V]	Output Voltage [V]																																		
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Note: Slanted line shows the range of the rated input voltage.																																			

Model	MMC100B-4																																		
Item	Line Regulation	Temperature	25°C																																
Object	-12V1A	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>Output Voltage [V]</p> <p>Input Voltage [V]</p> <p>Note: Slanted line shows the range of the rated input voltage.</p>		<table><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><tr><td>75</td><td>-12.050</td><td>-12.048</td></tr><tr><td>80</td><td>-12.048</td><td>-12.049</td></tr><tr><td>85</td><td>-12.047</td><td>-12.050</td></tr><tr><td>90</td><td>-12.047</td><td>-12.050</td></tr><tr><td>100</td><td>-12.047</td><td>-12.052</td></tr><tr><td>110</td><td>-12.046</td><td>-12.052</td></tr><tr><td>120</td><td>-12.047</td><td>-12.053</td></tr><tr><td>132</td><td>-12.047</td><td>-12.054</td></tr><tr><td>140</td><td>-12.047</td><td>-12.055</td></tr></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	75	-12.050	-12.048	80	-12.048	-12.049	85	-12.047	-12.050	90	-12.047	-12.050	100	-12.047	-12.052	110	-12.046	-12.052	120	-12.047	-12.053	132	-12.047	-12.054	140	-12.047	-12.055
Input Voltage [V]	Output Voltage [V]																																		
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Model	MMC100B-4																																																					
Item	Load Regulation		Temperature 25°C																																																			
Object	+5V8A		Testing Circuitry Figure A																																																			
1.Graph		2.Values																																																				
<div><div><div>—△—</div><div>Input Volt.</div><div>85V</div></div><div><div>---□---</div><div>Input Volt.</div><div>100V</div></div><div><div>---○---</div><div>Input Volt.</div><div>132V</div></div></div> 		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 85[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 132[V]</th></tr><tr><td>0.0</td><td>5.094</td><td>5.093</td><td>5.092</td></tr><tr><td>1.5</td><td>5.091</td><td>5.091</td><td>5.090</td></tr><tr><td>3.0</td><td>5.088</td><td>5.087</td><td>5.087</td></tr><tr><td>4.5</td><td>5.085</td><td>5.084</td><td>5.083</td></tr><tr><td>6.0</td><td>5.082</td><td>5.081</td><td>5.080</td></tr><tr><td>7.5</td><td>5.079</td><td>5.078</td><td>5.077</td></tr><tr><td>8.0</td><td>5.078</td><td>5.077</td><td>5.076</td></tr><tr><td>8.8</td><td>5.076</td><td>5.075</td><td>5.074</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]	Output Voltage [V]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.0	5.094	5.093	5.092	1.5	5.091	5.091	5.090	3.0	5.088	5.087	5.087	4.5	5.085	5.084	5.083	6.0	5.082	5.081	5.080	7.5	5.079	5.078	5.077	8.0	5.078	5.077	5.076	8.8	5.076	5.075	5.074	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Output Voltage [V]																																																					
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Load Current [A]	Output Voltage [V]																																																					
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]																																																			
0.0	11.998	11.998	11.998																																																			
0.8	11.996	11.996	11.996																																																			
1.6	11.994	11.994	11.994																																																			
2.4	11.992	11.992	11.992																																																			
3.2	11.990	11.990	11.990																																																			
4.0	11.988	11.988	11.988																																																			
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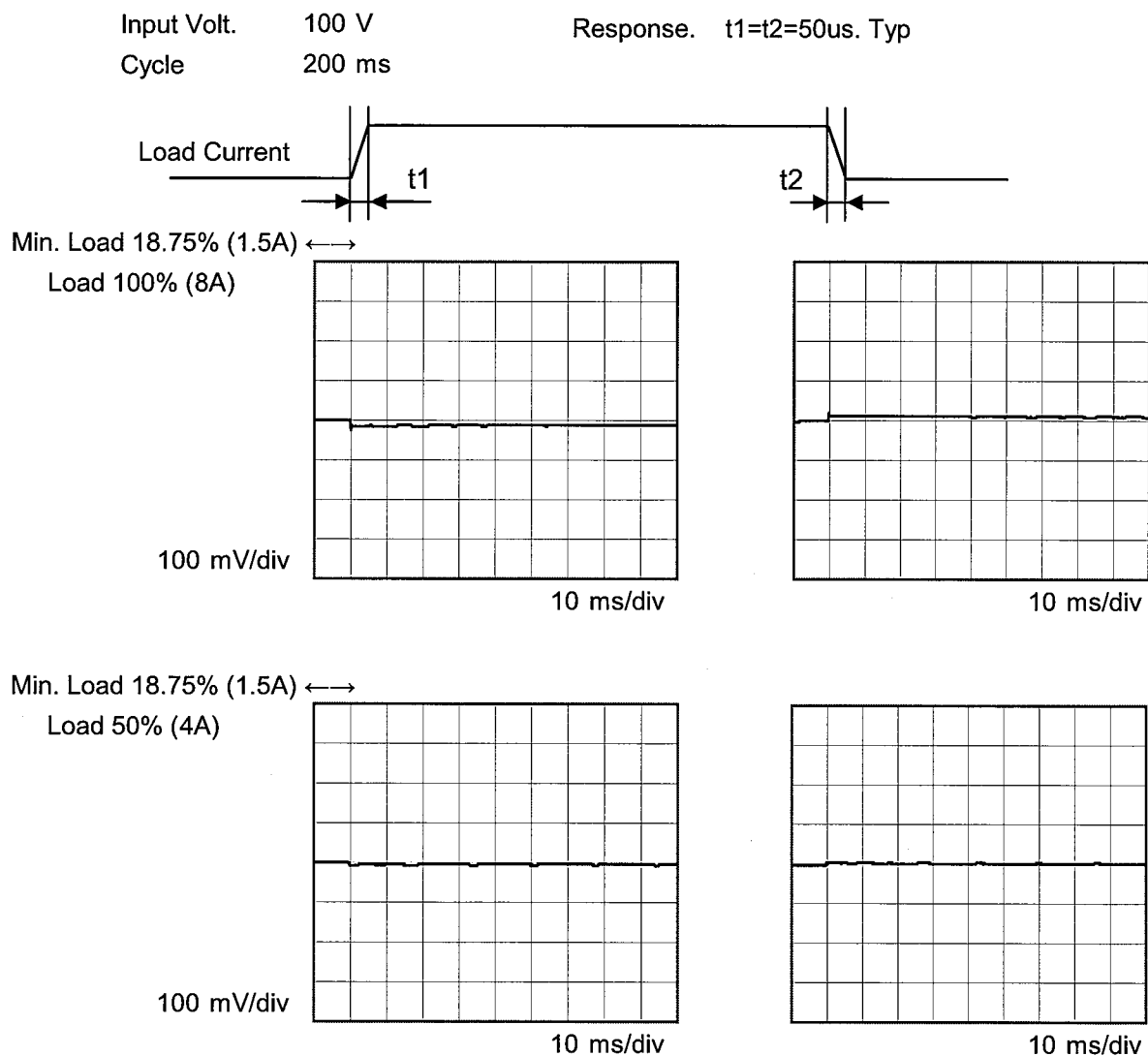
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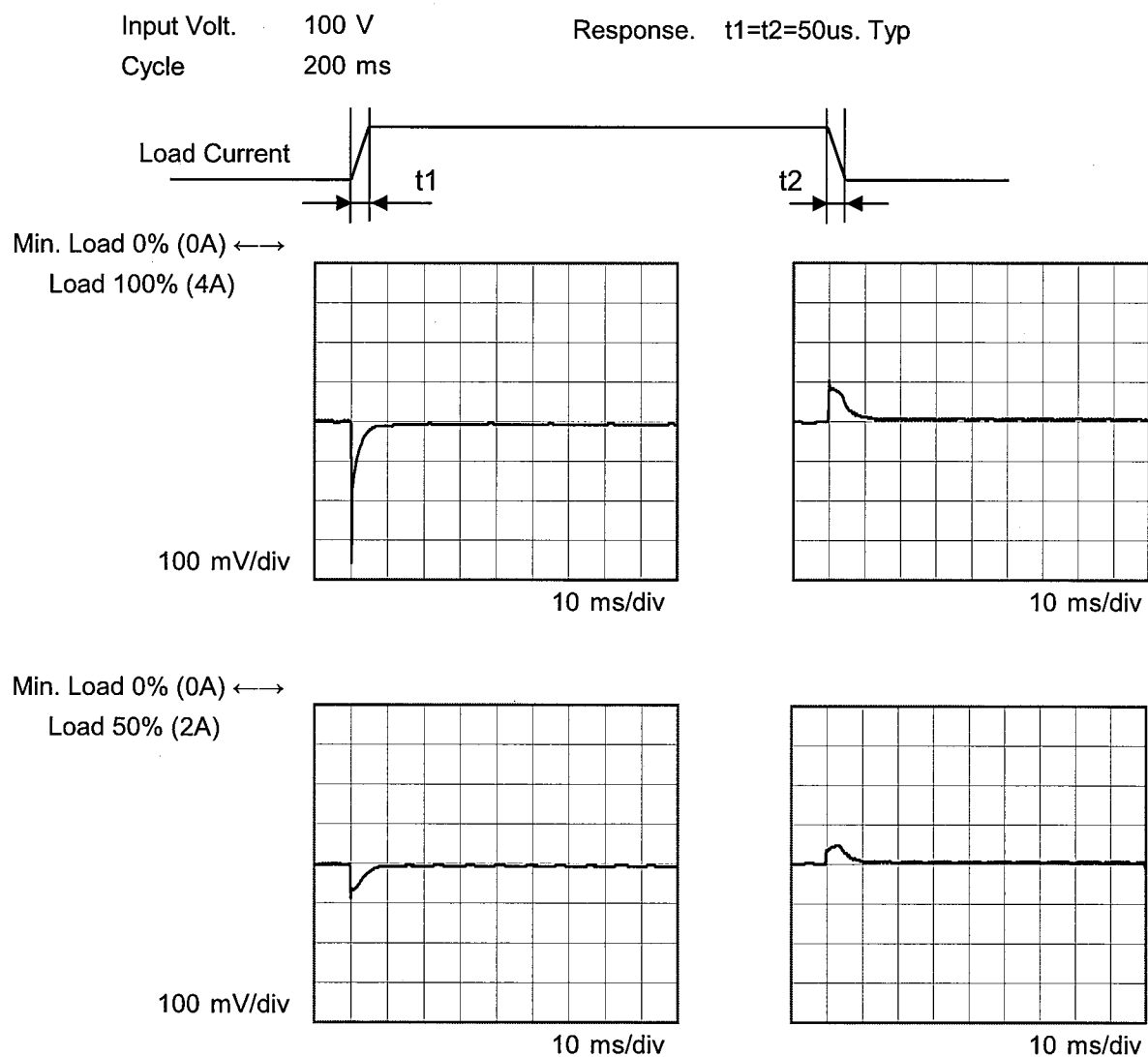
# COSEL

Model	MMC100B-4	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+5V8A		



**COSEL**

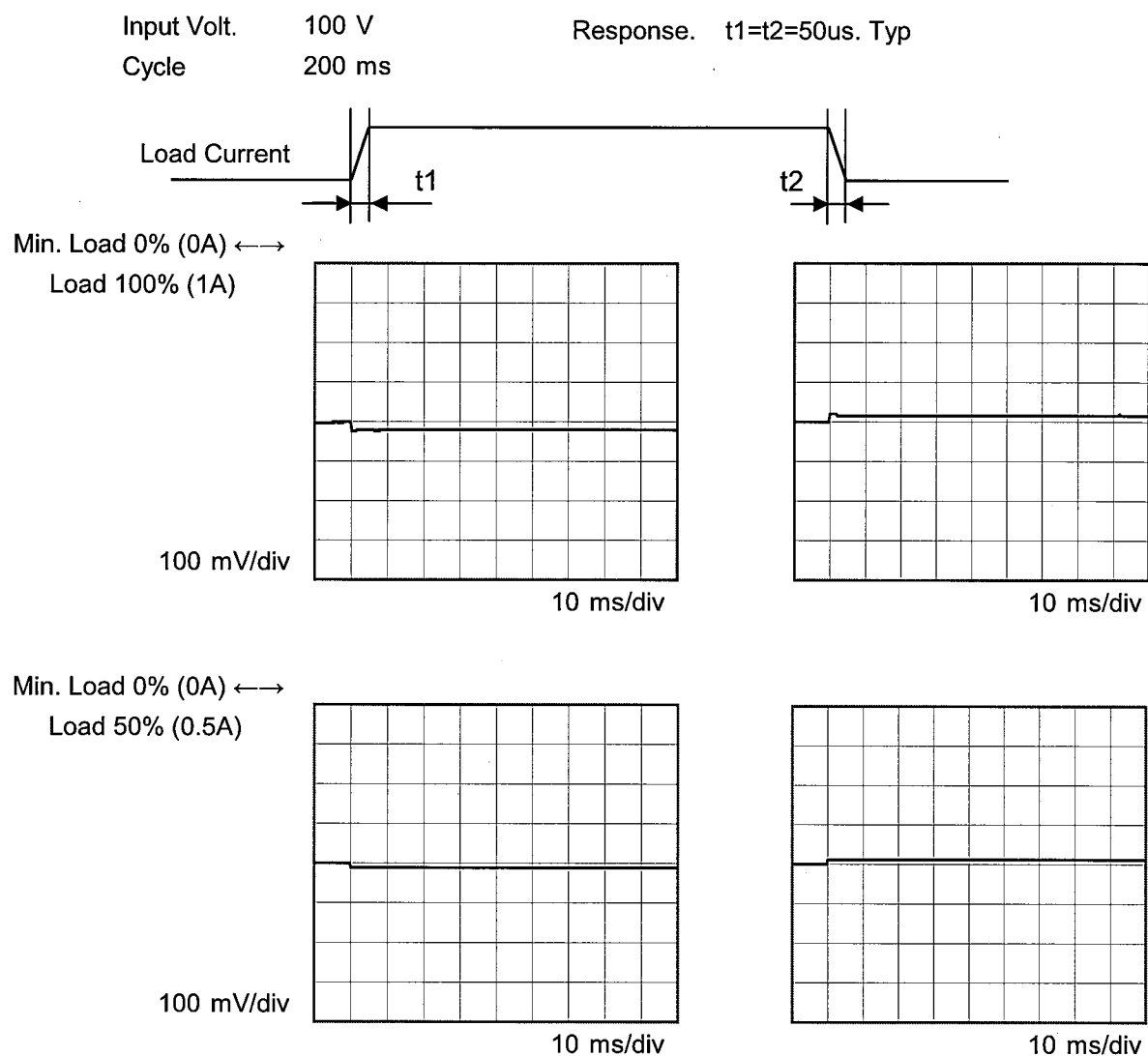
Model	MMC100B-4	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+12V4A		





**COSEL**

Model	MMC100B-4	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	-12V1A		



# COSEL

Model		MMC100B-4																																							
Item		Ripple Voltage (by Load Current)																																							
Object		+5V8A																																							
1.Graph		2.Values																																							
<div><div><div>—△— Input Volt. 85V</div><div>-·-○-·- Input Volt. 132V</div></div><div>Ripple Voltage [mV]</div><div>Load Current [A]</div></div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 85 [V]</th><th>Input Volt. 132 [V]</th></tr><tr><td>0.0</td><td>10</td><td>10</td></tr><tr><td>1.6</td><td>15</td><td>15</td></tr><tr><td>3.2</td><td>15</td><td>15</td></tr><tr><td>4.8</td><td>15</td><td>15</td></tr><tr><td>6.4</td><td>15</td><td>15</td></tr><tr><td>8.0</td><td>15</td><td>15</td></tr><tr><td>8.8</td><td>15</td><td>15</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. 85 [V]	Input Volt. 132 [V]	0.0	10	10	1.6	15	15	3.2	15	15	4.8	15	15	6.4	15	15	8.0	15	15	8.8	15	15	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																								
	Input Volt. 85 [V]	Input Volt. 132 [V]																																							
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<div>Measured by 20 MHz Oscilloscope.</div> <div>Ripple Voltage is shown as p-p in the figure below.</div> <div>Note: Slanted line shows the range of the rated load current.</div>																																									
<div><div>T1: Due to AC Input Line</div><div>T2: Due to Switching</div><div>Ripple [mVp-p]</div><div>T1</div><div>T2</div></div>																																									
Fig. Complex Ripple Wave Form																																									

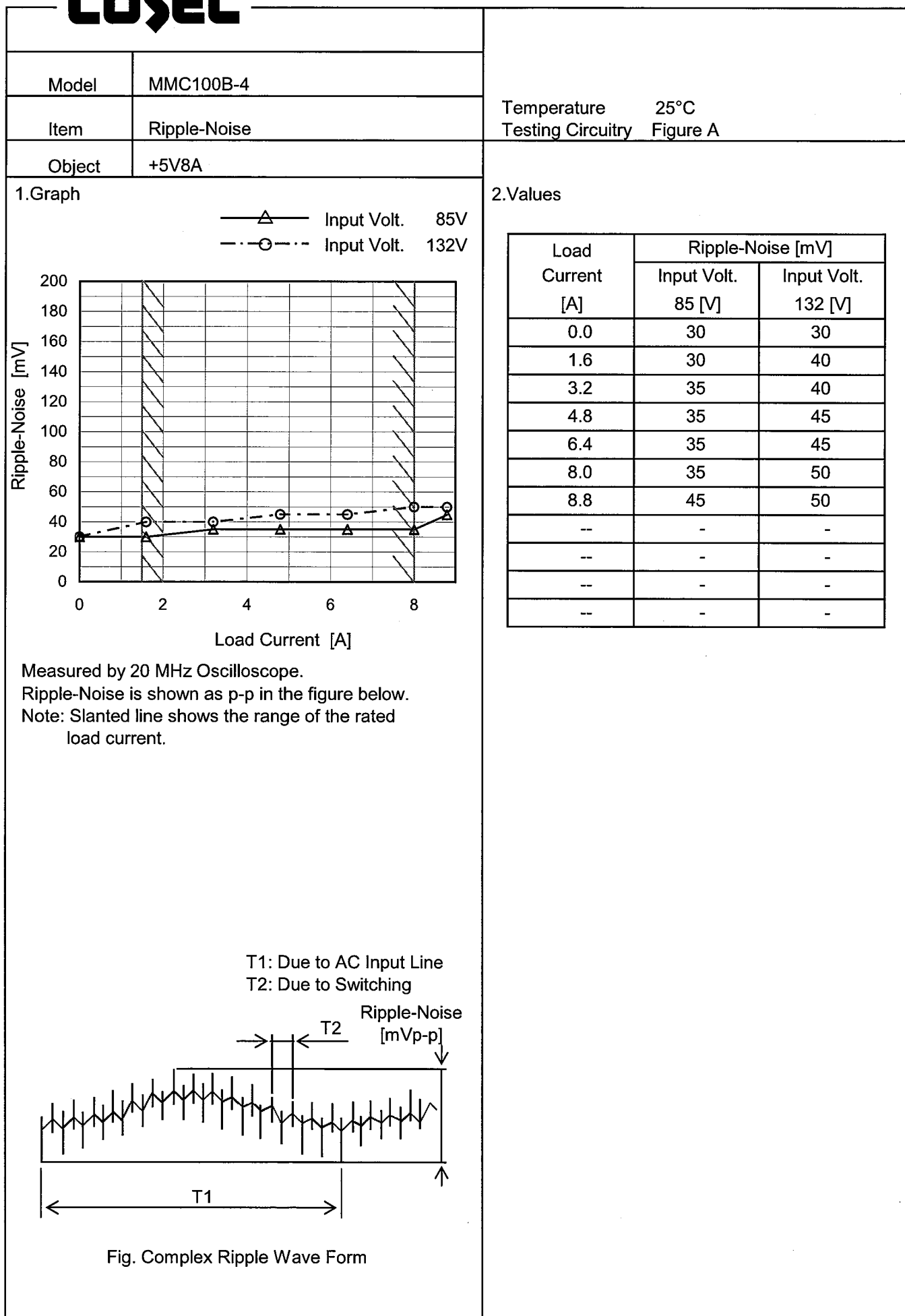
# COSEL

Model		MMC100B-4		Temperature 25°C																																							
Item		Ripple Voltage (by Load Current)		Testing Circuitry Figure A																																							
Object		+12V4A																																									
1.Graph				2.Values																																							
<div><div><div>—△— Input Volt. 85V</div><div>-·-○-·- Input Volt. 132V</div></div><div>Ripple Voltage [mV]</div><div>Load Current [A]</div></div>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="2">Ripple Voltage [mV]</th></tr><tr><th>Input Volt. 85 [V]</th><th>Input Volt. 132 [V]</th></tr><tr><td>0.0</td><td>15</td><td>15</td></tr><tr><td>0.8</td><td>20</td><td>25</td></tr><tr><td>1.6</td><td>20</td><td>30</td></tr><tr><td>2.4</td><td>25</td><td>30</td></tr><tr><td>3.2</td><td>30</td><td>30</td></tr><tr><td>4.0</td><td>35</td><td>35</td></tr><tr><td>4.4</td><td>35</td><td>35</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. 85 [V]	Input Volt. 132 [V]	0.0	15	15	0.8	20	25	1.6	20	30	2.4	25	30	3.2	30	30	4.0	35	35	4.4	35	35	--	-	-	--	-	-	--	-	-	--	-	-
Load Current [A]	Ripple Voltage [mV]																																										
	Input Volt. 85 [V]	Input Volt. 132 [V]																																									
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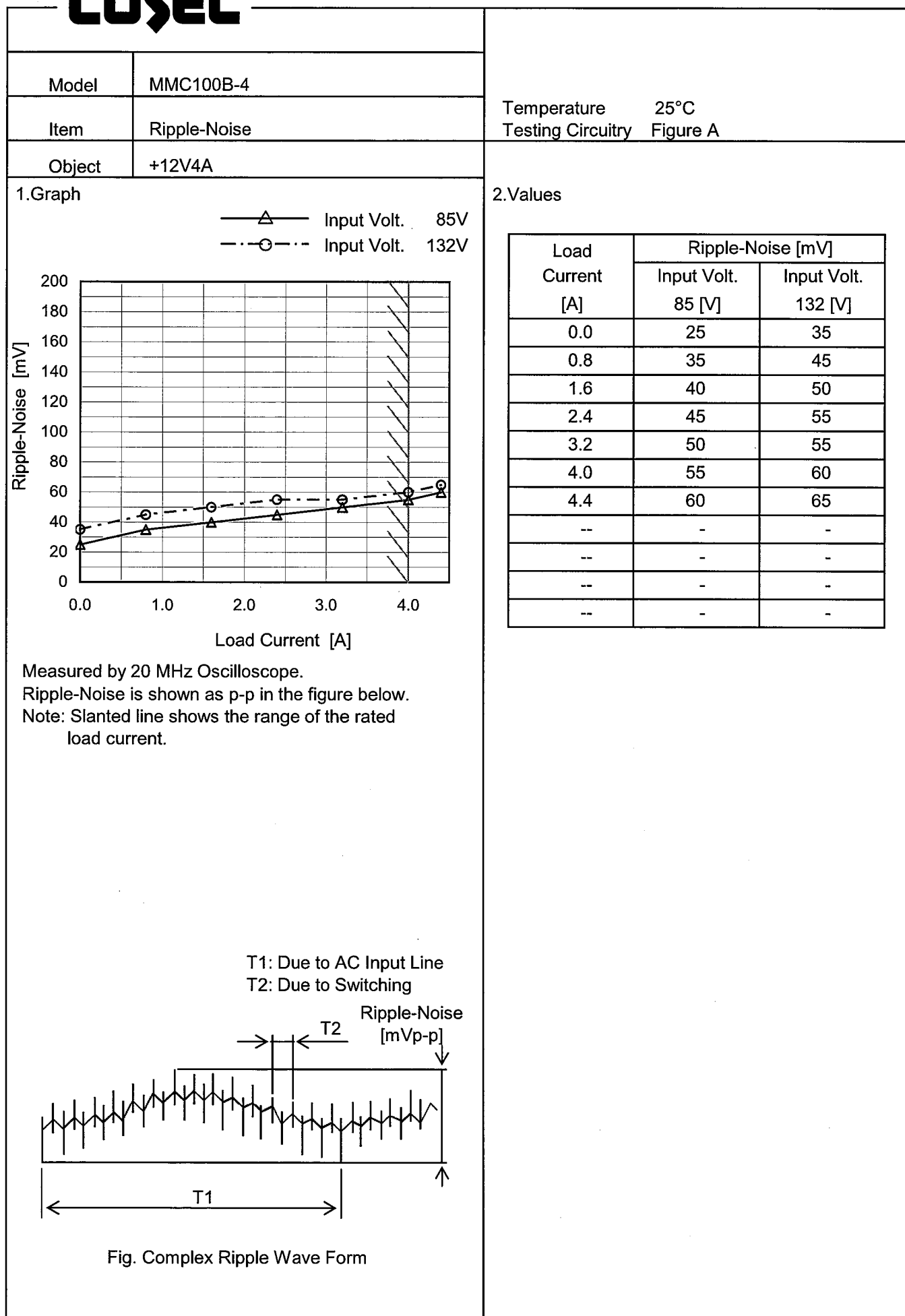
# COSEL

Model		MMC100B-4	
Item		Ripple Voltage (by Load Current)	
Object		-12V1A	
1.Graph		2.Values	

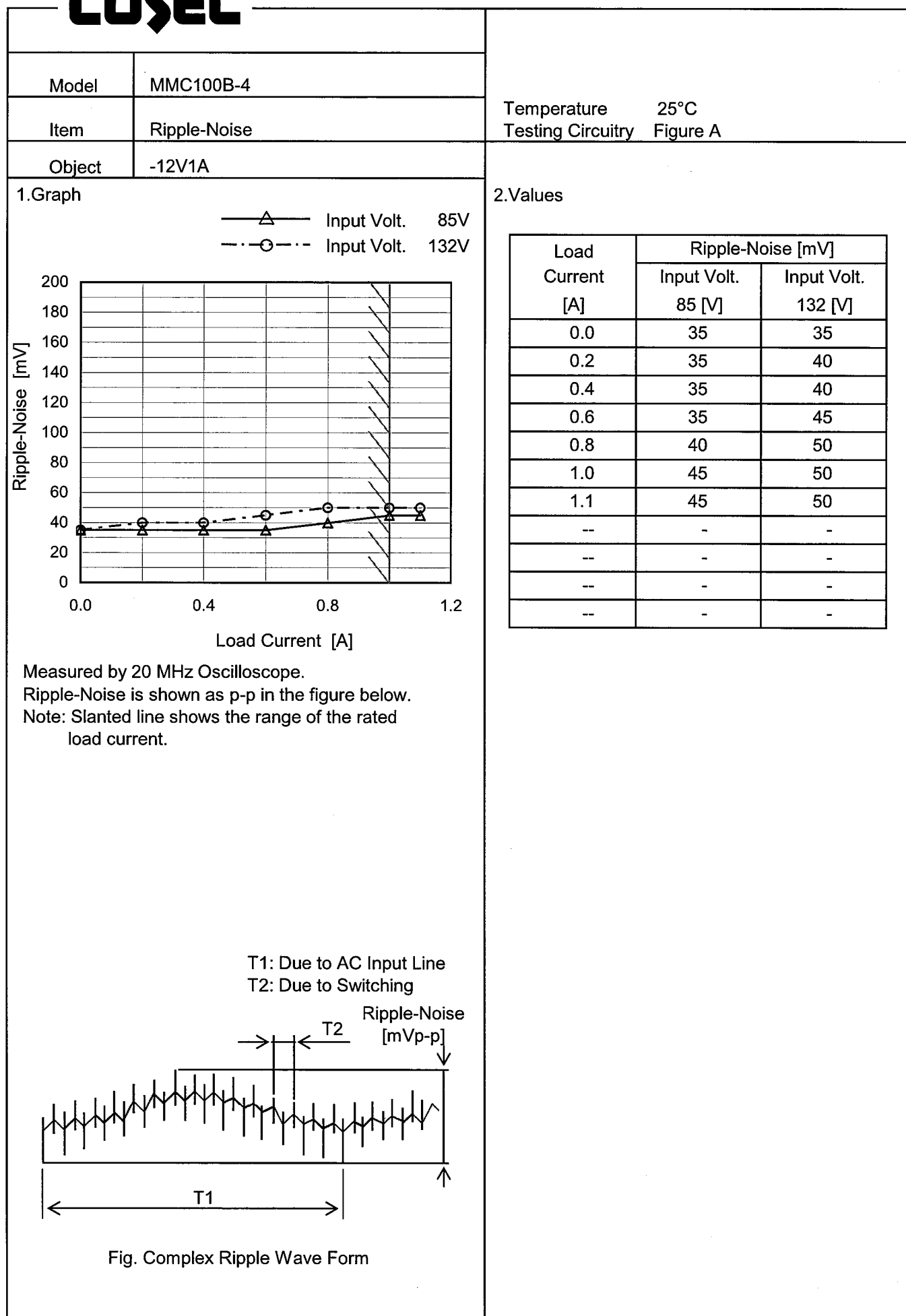
# COSEL



# COSEL



# COSEL



# COSEL

Model	MMC100B-4																																								
Item	Ripple Voltage (by Ambient Temp.)		Testing Circuitry    Figure A																																						
Object	+5V8A																																								
1.Graph		2.Values																																							
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Note: Slanted line shows the range of the rated ambient temperature.																																									



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Model	MMC100B-4																																																						
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Object	+5V8A																																																						
1.Graph		2.Values																																																					
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Note: Slanted line shows the range of the rated ambient temperature.																																																							

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Model		MMC100B-4	
Item		Ambient Temperature Drift	
Object		-12V1A	
1.Graph		2.Values	
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		Testing Circuitry Figure A
Model	MMC100B-4	
Item	Output Voltage Accuracy	

### 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 : 0 - 50°C

Input Voltage : 85 - 132V

Load Current (AVR 1) : 1.5 - 8A (AVR 2) : 0 - 4A (AVR 3) : 0 - 1A

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

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

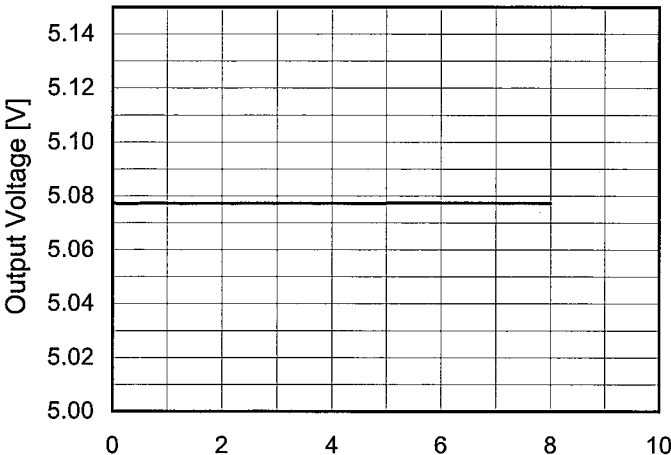
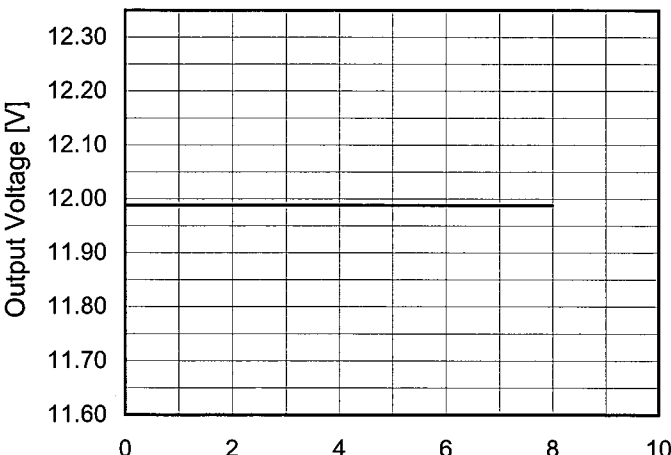
### 2. Values

Object	+5V8A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	30	132	1.5	5.095	±10	±0.2
Minimum Voltage	50	132	8	5.075		

Object	+12V4A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	40	85	0	12.003	±11	±0.1
Minimum Voltage	0	85	4	11.981		

Object	-12V1A					
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	50	85	0	-12.086	±57	±0.5
Minimum Voltage	0	85	1	-11.972		

**COSEL**

Model	MMC100B-4																								
Item	Time Lapse Drift		Temperature 25°C																						
Object	+5V8A		Testing Circuitry Figure A																						
1.Graph		2.Values																							
<div><p>Input Volt. 100V Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>5.078</td></tr><tr><td>0.5</td><td>5.077</td></tr><tr><td>1.0</td><td>5.077</td></tr><tr><td>2.0</td><td>5.077</td></tr><tr><td>3.0</td><td>5.077</td></tr><tr><td>4.0</td><td>5.077</td></tr><tr><td>5.0</td><td>5.077</td></tr><tr><td>6.0</td><td>5.077</td></tr><tr><td>7.0</td><td>5.077</td></tr><tr><td>8.0</td><td>5.077</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	5.078	0.5	5.077	1.0	5.077	2.0	5.077	3.0	5.077	4.0	5.077	5.0	5.077	6.0	5.077	7.0	5.077	8.0	5.077
Time since start [H]	Output Voltage [V]																								
0.0	5.078																								
0.5	5.077																								
1.0	5.077																								
2.0	5.077																								
3.0	5.077																								
4.0	5.077																								
5.0	5.077																								
6.0	5.077																								
7.0	5.077																								
8.0	5.077																								
Object	+12V4A																								
1.Graph		2.Values																							
<div><p>Input Volt. 100V Load 100%</p></div>		<table><tr><th>Time since start [H]</th><th>Output Voltage [V]</th></tr><tr><td>0.0</td><td>11.989</td></tr><tr><td>0.5</td><td>11.988</td></tr><tr><td>1.0</td><td>11.988</td></tr><tr><td>2.0</td><td>11.988</td></tr><tr><td>3.0</td><td>11.988</td></tr><tr><td>4.0</td><td>11.988</td></tr><tr><td>5.0</td><td>11.988</td></tr><tr><td>6.0</td><td>11.988</td></tr><tr><td>7.0</td><td>11.988</td></tr><tr><td>8.0</td><td>11.988</td></tr></table>		Time since start [H]	Output Voltage [V]	0.0	11.989	0.5	11.988	1.0	11.988	2.0	11.988	3.0	11.988	4.0	11.988	5.0	11.988	6.0	11.988	7.0	11.988	8.0	11.988
Time since start [H]	Output Voltage [V]																								
0.0	11.989																								
0.5	11.988																								
1.0	11.988																								
2.0	11.988																								
3.0	11.988																								
4.0	11.988																								
5.0	11.988																								
6.0	11.988																								
7.0	11.988																								
8.0	11.988																								

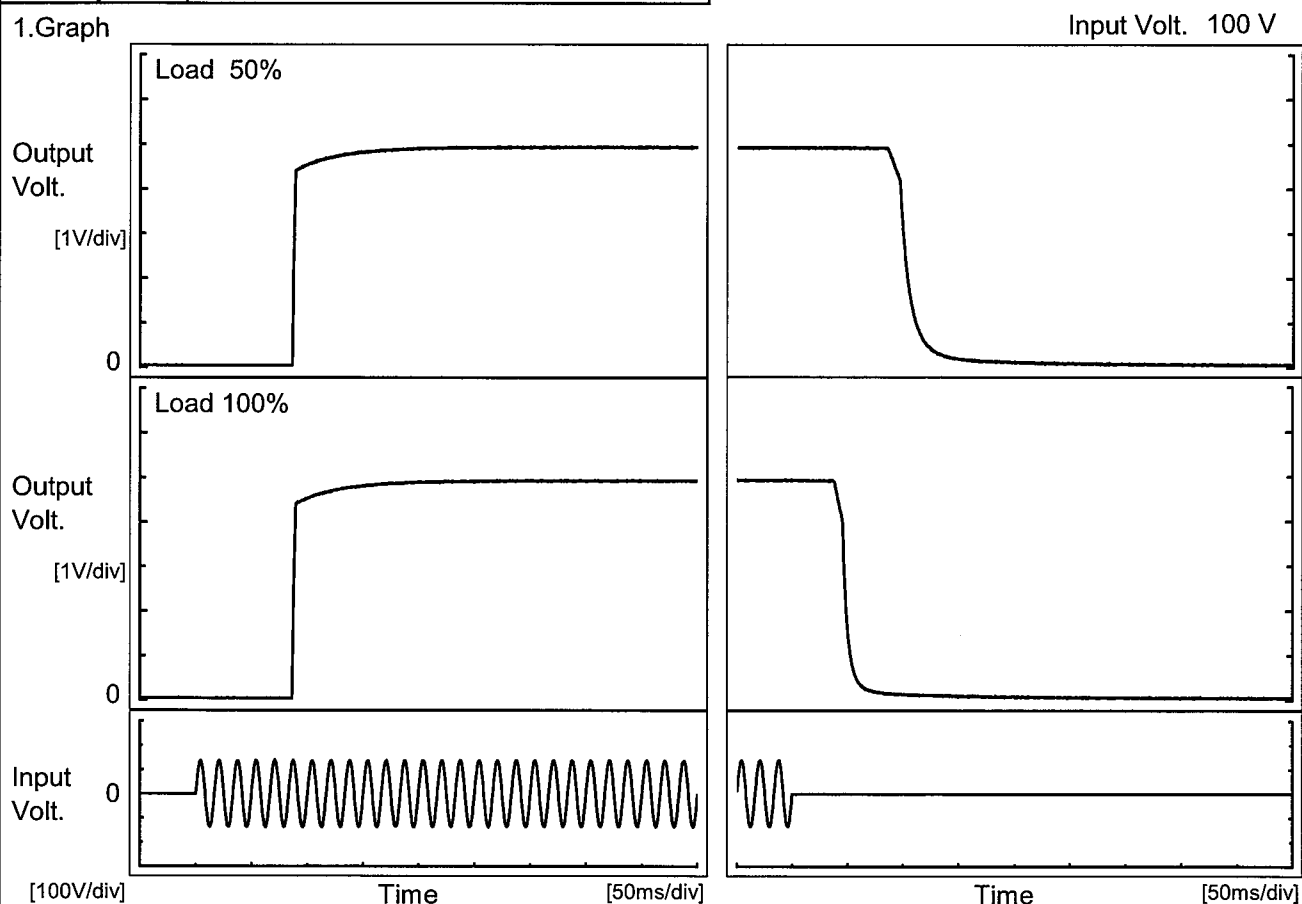
# COSEL

Model	MMC100B-4	Temperature 25°C Testing Circuitry Figure A		
Item	Time Lapse Drift			
Object	-12V1A			
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></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><d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# COSEL

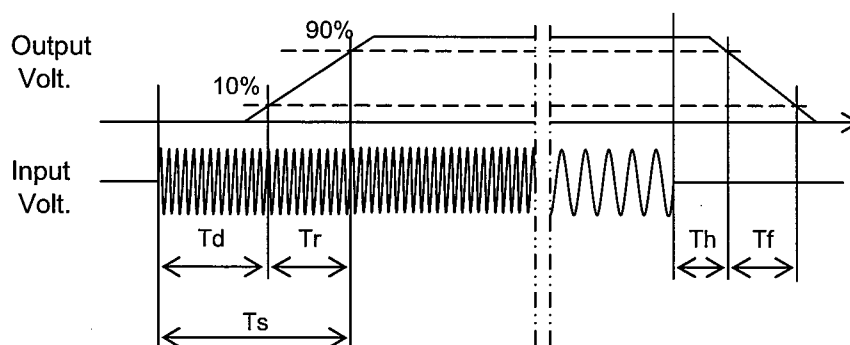
Model	MMC100B-4	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+5V8A		

## 1. Graph



## 2. Values

		[ms]				
Load	Time	Td	Tr	Ts	Th	Tf
50 %		87.0	12.8	99.8	91.5	28.8
100 %		87.0	13.5	100.5	41.0	16.3

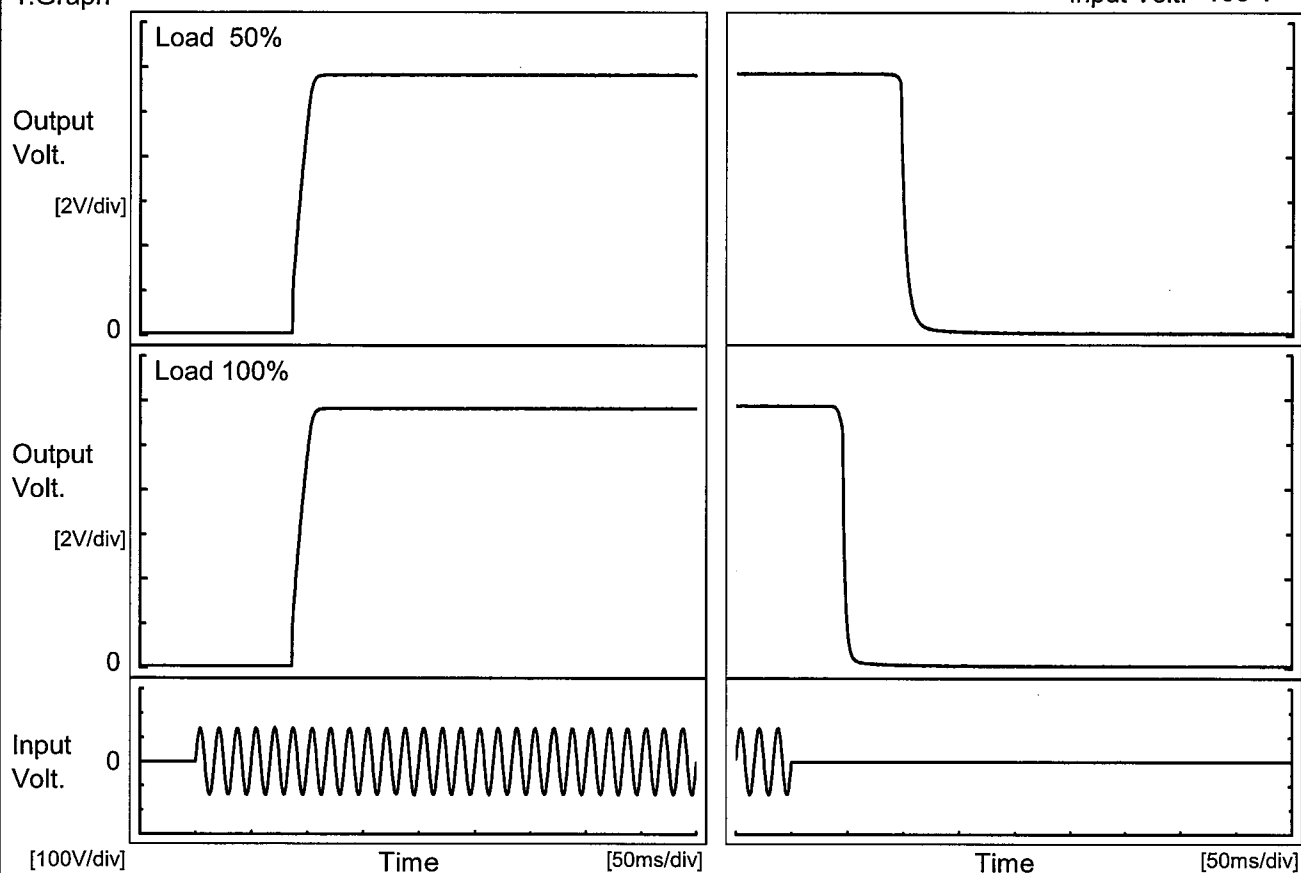


# COSEL

Model	MMC100B-4	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+12V4A		

## 1.Graph

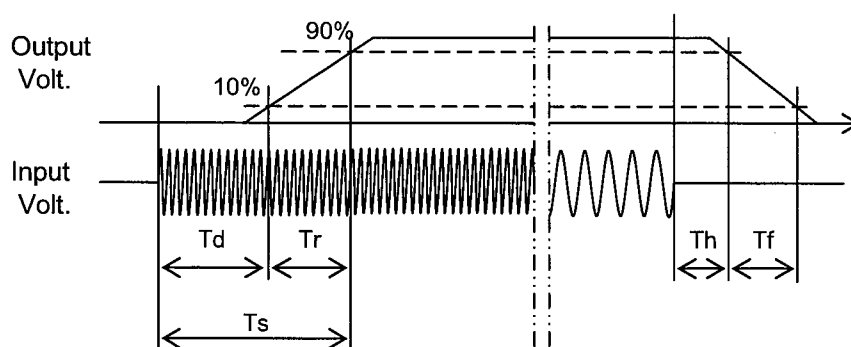
Input Volt. 100 V



## 2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	87.0	16.0	103.0	97.0	10.8
100 %	87.0	16.3	103.3	44.8	6.0

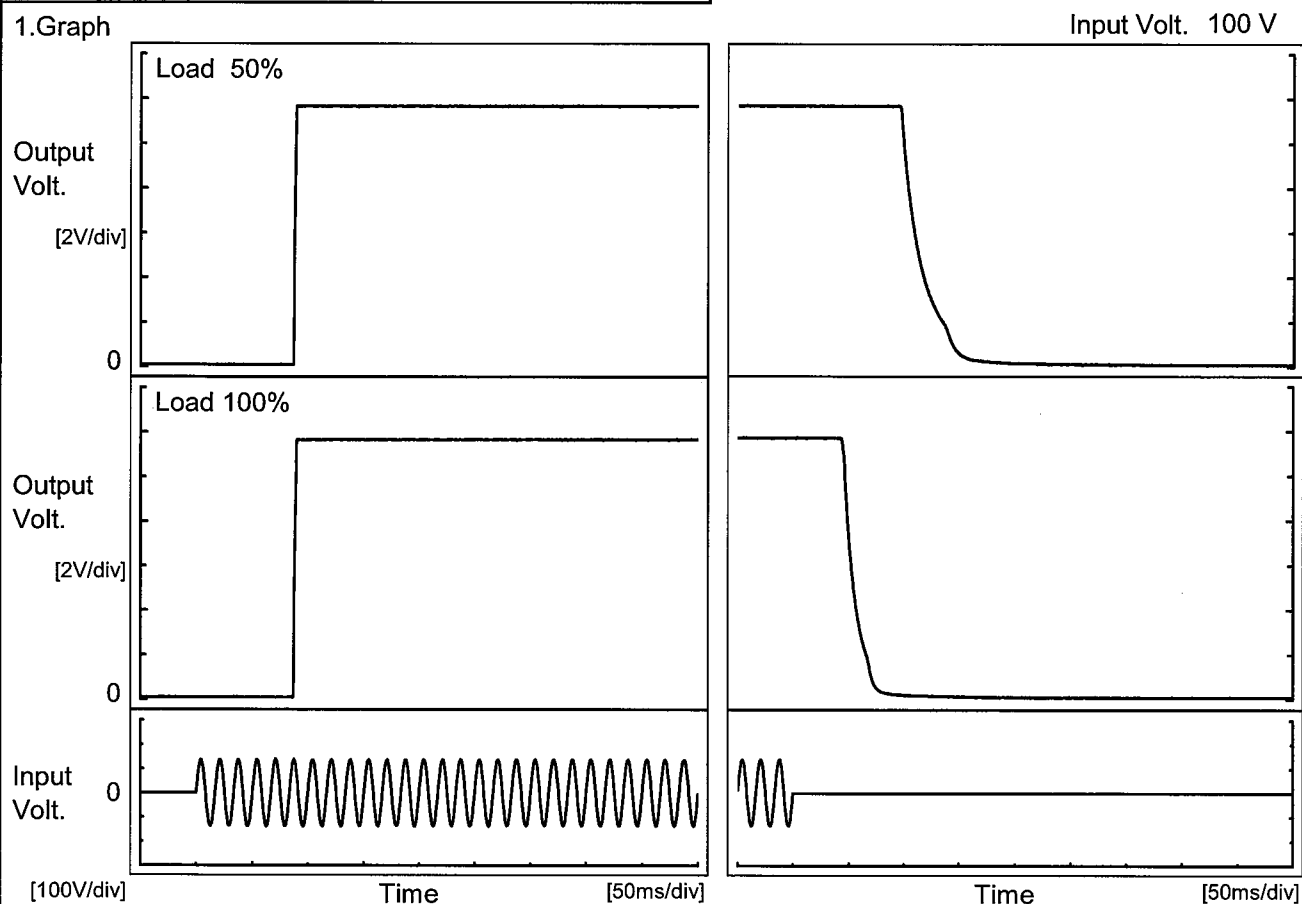




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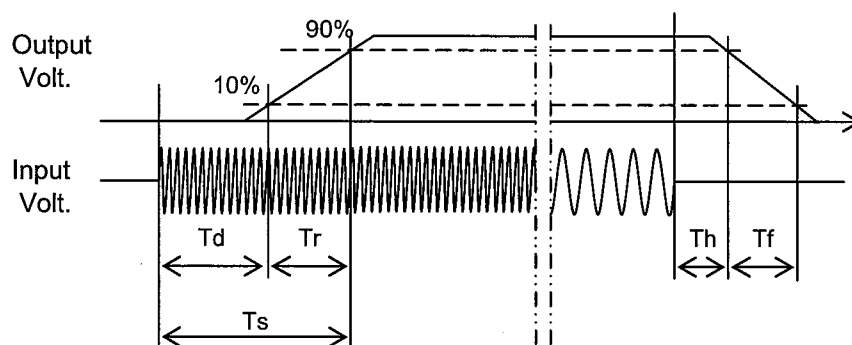
Model	MMC100B-4	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	-12V1A		

## 1.Graph



## 2.Values

		[ms]				
Load	Time	Td	Tr	Ts	Th	Tf
50 %		87.5	2.0	89.5	97.8	43.3
100 %		87.3	2.5	89.8	45.5	23.8



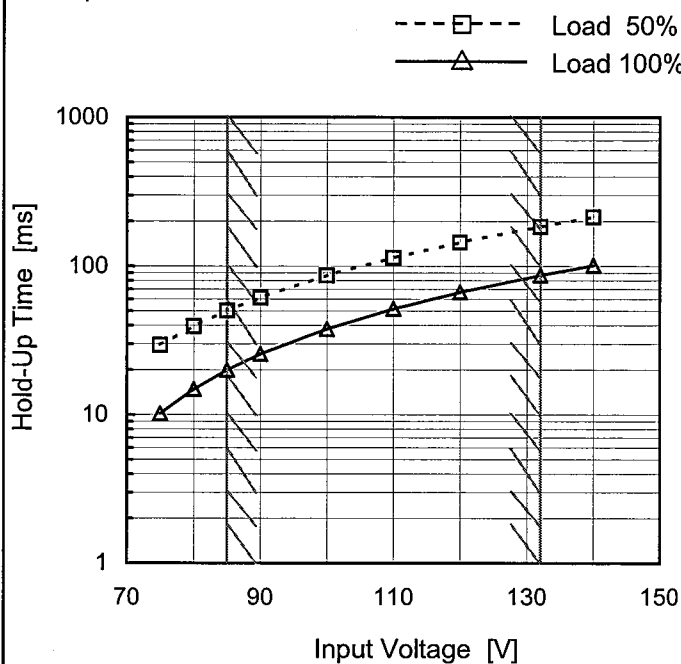
Model MMC100B-4

Item Hold-Up Time

Object +5V8A

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%
75	29	10
80	39	15
85	50	20
90	61	26
100	87	38
110	114	52
120	144	67
132	184	87
140	213	102

Model		MMC100B-4																																	
Item		Hold-Up Time																																	
Object		+12V4A																																	
1.Graph		Temperature 25°C Testing Circuitry Figure A																																	
<div><div><div>---□---</div><div>Load 50%</div></div><div><div>—△—</div><div>Load 100%</div></div></div> <div>Hold-Up Time [ms]</div> <div>Input Voltage [V]</div>		2.Values																																	
		<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Hold-Up Time [ms]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>75</td><td>37</td><td>12</td></tr><tr><td>80</td><td>47</td><td>17</td></tr><tr><td>85</td><td>58</td><td>22</td></tr><tr><td>90</td><td>69</td><td>28</td></tr><tr><td>100</td><td>94</td><td>40</td></tr><tr><td>110</td><td>121</td><td>54</td></tr><tr><td>120</td><td>152</td><td>69</td></tr><tr><td>132</td><td>192</td><td>89</td></tr><tr><td>140</td><td>221</td><td>104</td></tr></table>		Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	75	37	12	80	47	17	85	58	22	90	69	28	100	94	40	110	121	54	120	152	69	132	192	89	140	221	104
Input Voltage [V]	Hold-Up Time [ms]																																		
	Load 50%	Load 100%																																	
75	37	12																																	
80	47	17																																	
85	58	22																																	
90	69	28																																	
100	94	40																																	
110	121	54																																	
120	152	69																																	
132	192	89																																	
140	221	104																																	
<p>This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.</p> <p>Note: Slanted line shows the range of the rated input voltage.</p>																																			

Model

MMC100B-4

Item

Hold-Up Time

Object

-12V1A

Temperature

25°C

Testing Circuitry

Figure A

1.Graph

---□---

Load 50%

—△—

Load 100%

Hold-Up Time [ms]

1000

100

10

1

Input Voltage [V]

70

90

110

130

150

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%
75	40	16
80	50	21
85	60	26
90	72	31
100	97	44
110	124	57
120	155	73
132	195	93
140	224	107

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Model	MMC100B-4																																																					
Item	Instantaneous Interruption Compensation	Temperature	25°C																																																			
Object	+5V8A	Testing Circuitry	Figure A																																																			
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<div><div><div>—△—</div><div>Input Volt.</div><div>85V</div></div><div><div>---□---</div><div>Input Volt.</div><div>100V</div></div><div><div>-·-○-·-</div><div>Input Volt.</div><div>132V</div></div></div> <div>Instantaneous Compensation Time [ms]</div> <div>Load Current [A]</div> <div>Note: Slanted line shows the range of the rated load current.</div>		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Time [ms]</th></tr><tr><th>Input Volt. 85[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 132[V]</th></tr><tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>1.5</td><td>39</td><td>66</td><td>140</td></tr><tr><td>3.0</td><td>34</td><td>58</td><td>124</td></tr><tr><td>4.5</td><td>30</td><td>52</td><td>112</td></tr><tr><td>6.0</td><td>26</td><td>47</td><td>102</td></tr><tr><td>7.5</td><td>22</td><td>42</td><td>92</td></tr><tr><td>8.0</td><td>22</td><td>39</td><td>90</td></tr><tr><td>8.8</td><td>21</td><td>38</td><td>86</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. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.0	-	-	-	1.5	39	66	140	3.0	34	58	124	4.5	30	52	112	6.0	26	47	102	7.5	22	42	92	8.0	22	39	90	8.8	21	38	86	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																					
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BC-10559

Model	MMC100B-4																																																						
Item	Instantaneous Interruption Compensation		Temperature	25°C																																																			
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Load Current [A]	Time [ms]																																																						
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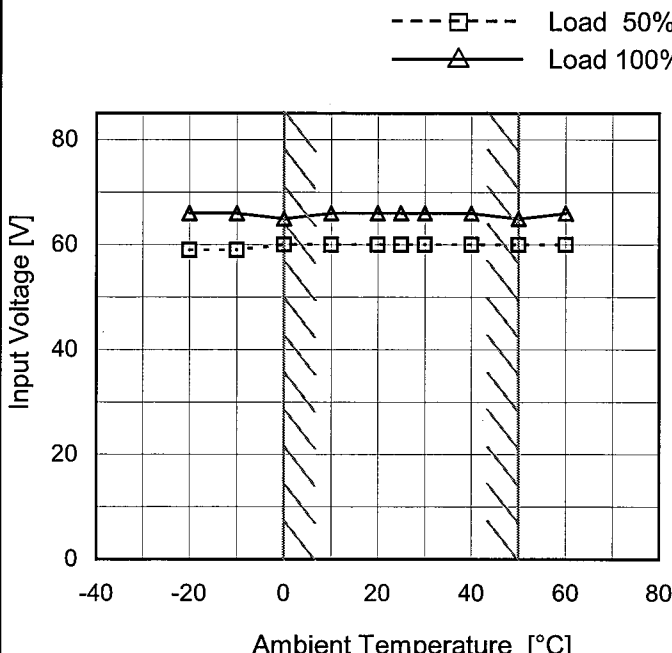
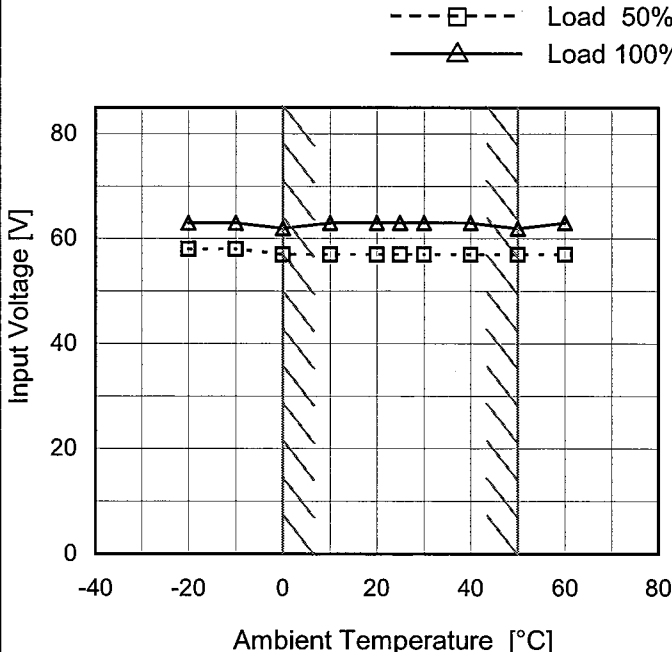
BC-10559

Model	MMC100B-4																																																					
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Load Current [A]	Time [ms]																																																					
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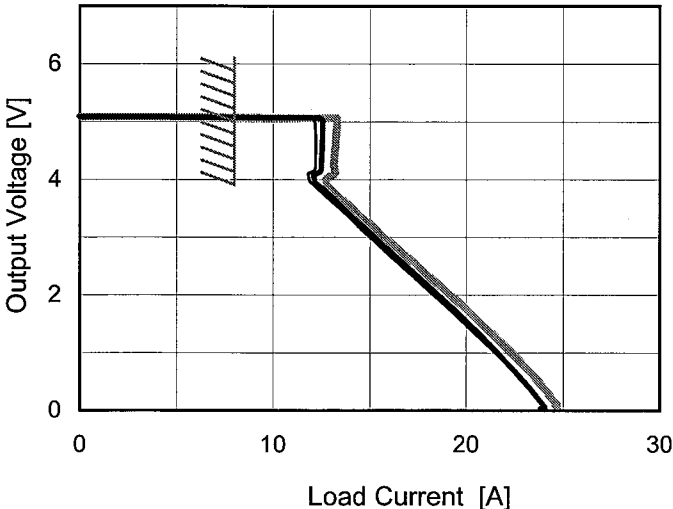
Model	MMC100B-4	Testing Circuitry    Figure A																																							
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Ambient Temperature [°C]	Input Voltage [V]																																								
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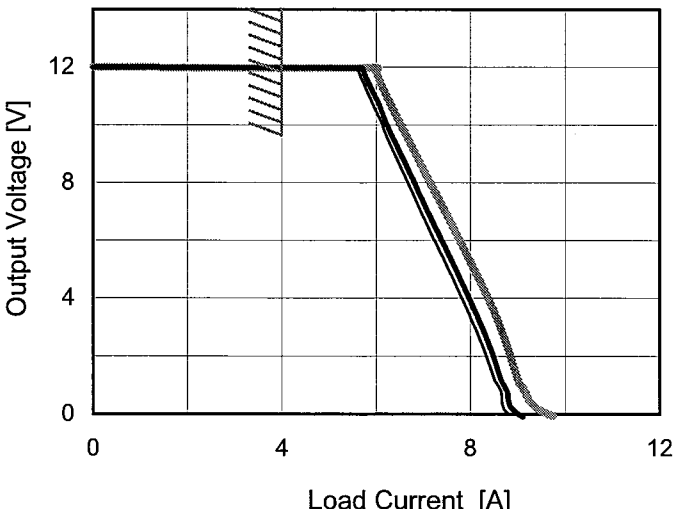
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Model	MMC100B-4	Testing Circuitry    Figure A																																					
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Ambient Temperature [°C]	Load 50% [V]	Load 100% [V]																																					
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Model		MMC100B-4																																																								
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<div><div><div></div><div></div><div></div></div><div><div>Input Volt. 85V</div><div>Input Volt. 100V</div><div>Input Volt. 132V</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. 85[V]</th><th>Input Volt. 100[V]</th><th>Input Volt. 132[V]</th></tr><tr><td>-11.40</td><td>2.65</td><td>2.76</td><td>2.99</td></tr><tr><td>-10.80</td><td>2.13</td><td>2.10</td><td>2.11</td></tr><tr><td>-9.60</td><td>2.97</td><td>3.06</td><td>3.30</td></tr><tr><td>-8.40</td><td>3.44</td><td>3.39</td><td>3.19</td></tr><tr><td>-7.20</td><td>3.34</td><td>3.15</td><td>2.75</td></tr><tr><td>-6.00</td><td>2.99</td><td>2.70</td><td>2.57</td></tr><tr><td>-4.80</td><td>2.60</td><td>2.49</td><td>2.44</td></tr><tr><td>-3.60</td><td>2.40</td><td>2.34</td><td>2.28</td></tr><tr><td>-2.40</td><td>2.13</td><td>2.06</td><td>1.97</td></tr><tr><td>-1.20</td><td>1.83</td><td>1.76</td><td>1.69</td></tr><tr><td>0.00</td><td>1.56</td><td>1.51</td><td>1.47</td></tr><tr><td>--</td><td>-</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]			Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]	-11.40	2.65	2.76	2.99	-10.80	2.13	2.10	2.11	-9.60	2.97	3.06	3.30	-8.40	3.44	3.39	3.19	-7.20	3.34	3.15	2.75	-6.00	2.99	2.70	2.57	-4.80	2.60	2.49	2.44	-3.60	2.40	2.34	2.28	-2.40	2.13	2.06	1.97	-1.20	1.83	1.76	1.69	0.00	1.56	1.51	1.47	--	-	-	-
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Model		MMC100B-4																																							
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Object		+5V8A																																							
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<div><div><div>—△—</div><div>Input Volt. 85V</div></div><div><div>---□---</div><div>Input Volt. 132V</div></div></div> <p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="2">Operating Point [V]</th></tr><tr><th>Input Volt. 85[V]</th><th>Input Volt. 132[V]</th></tr><tr><td>-20</td><td>6.30</td><td>6.30</td></tr><tr><td>-10</td><td>6.30</td><td>6.30</td></tr><tr><td>0</td><td>6.30</td><td>6.30</td></tr><tr><td>10</td><td>6.30</td><td>6.30</td></tr><tr><td>20</td><td>6.30</td><td>6.30</td></tr><tr><td>25</td><td>6.30</td><td>6.30</td></tr><tr><td>30</td><td>6.23</td><td>6.23</td></tr><tr><td>40</td><td>6.23</td><td>6.23</td></tr><tr><td>50</td><td>6.22</td><td>6.22</td></tr><tr><td>60</td><td>6.22</td><td>6.22</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Ambient Temperature [°C]	Operating Point [V]		Input Volt. 85[V]	Input Volt. 132[V]	-20	6.30	6.30	-10	6.30	6.30	0	6.30	6.30	10	6.30	6.30	20	6.30	6.30	25	6.30	6.30	30	6.23	6.23	40	6.23	6.23	50	6.22	6.22	60	6.22	6.22	--	-	-
Ambient Temperature [°C]	Operating Point [V]																																								
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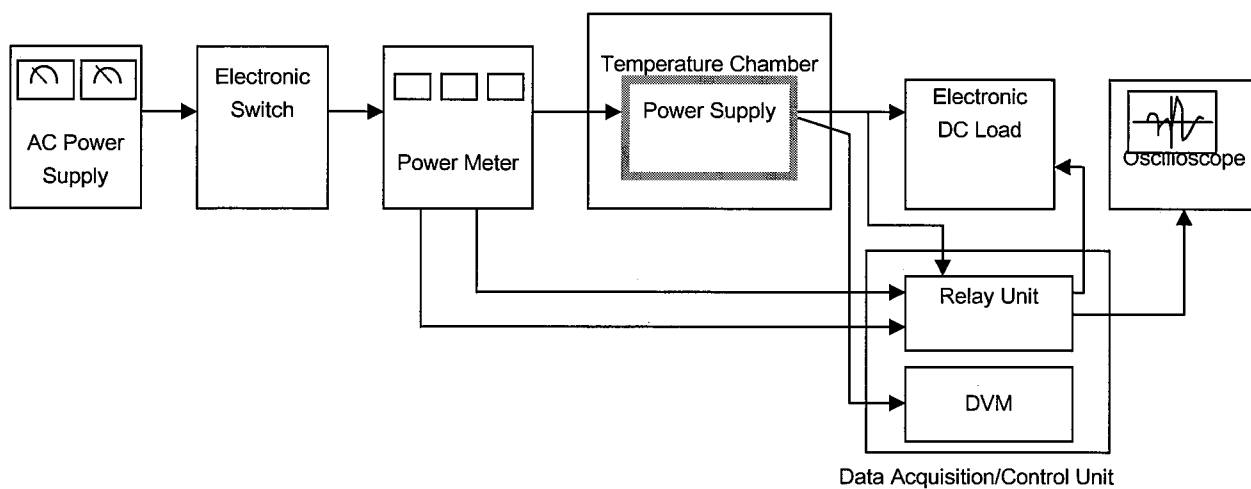


Figure A

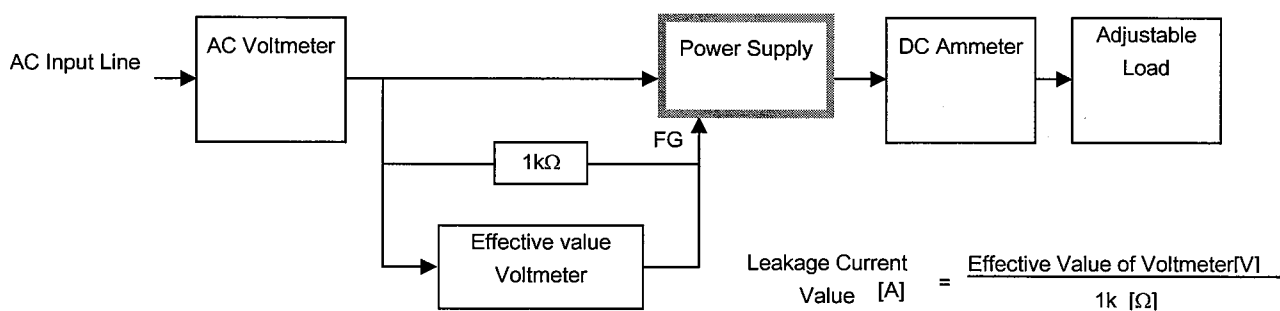


Figure B ( DEN-AN )

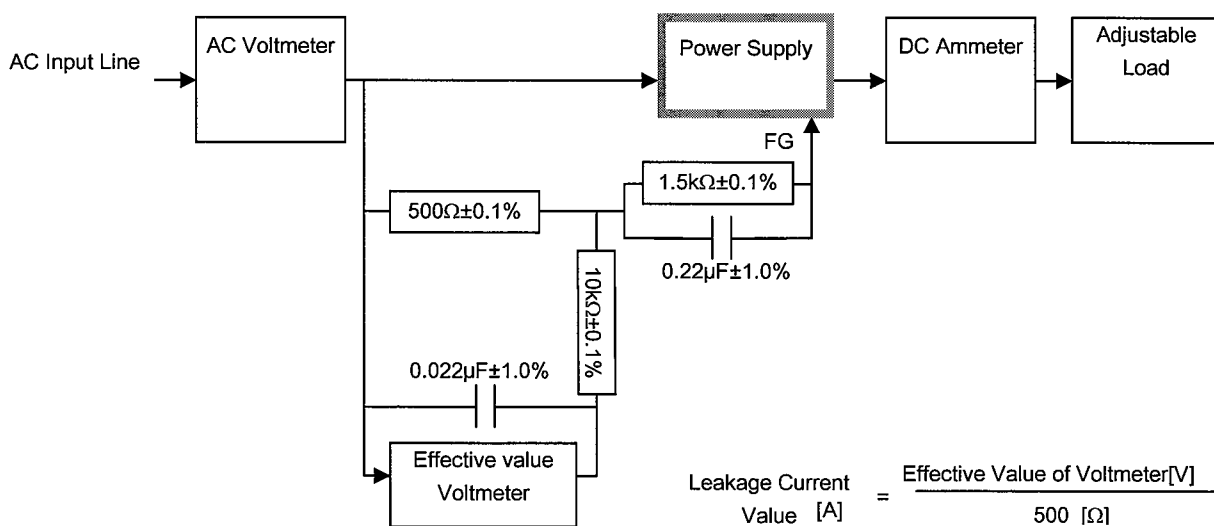


Figure B ( IEC60950-1 )