COSEL

TEST DATA OF MMC75B-3

Regulated DC Power Supply
January 11, 2011

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Hironobu Shimizu   Design Engineer

COSEL CO.,LTD.

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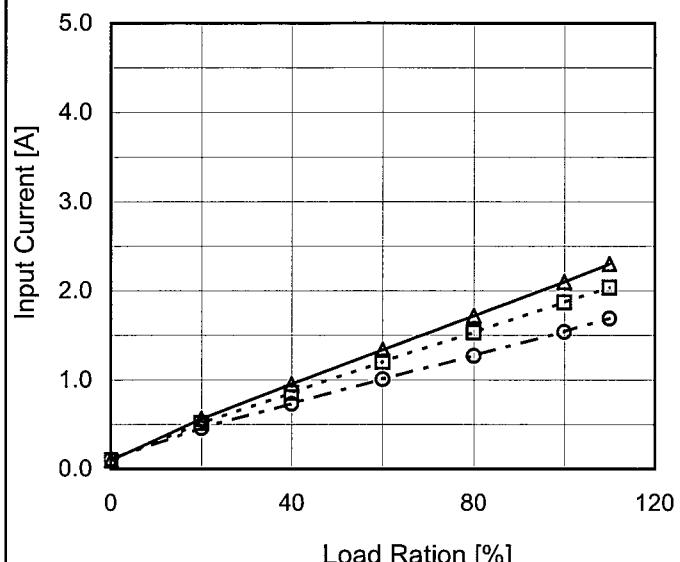
COSEL

Model	MMC75B-3
Item	Input Current (by Load Current)
Object	——————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph

————△———— Input Volt. 85V
– – –□– – – Input Volt. 100V
— · —○— · — Input Volt. 132V

2.Values

Load Ration [%]	Input Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0	0.096	0.098	0.107
20	0.564	0.514	0.459
40	0.956	0.856	0.732
60	1.340	1.202	1.008
80	1.721	1.535	1.273
100	2.102	1.870	1.542
110	2.304	2.038	1.693
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MMC75B-3
Item	Input Power (by Load Current)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

△ Input Volt. 85V
◻ Input Volt. 100V
○ Input Volt. 132V

2.Values

Load Ration [%]	Input Power [W]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0	2.9	3.3	4.5
20	21.2	21.9	23.8
40	38.9	39.5	41.1
60	57.4	57.7	59.1
80	76.7	76.7	77.7
100	97.0	96.5	96.9
110	107.4	106.7	106.8
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MMC75B-3
Item	Efficiency (by Input Voltage)
Object	————————

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

--- ▭ --- Load 50%
—— △ —— Load 100%

2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
75	76.0	74.5
80	75.8	74.8
85	75.8	75.0
90	75.7	75.3
100	75.1	75.4
110	74.5	75.4
120	73.7	75.3
132	72.7	75.1
140	72.0	74.9

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

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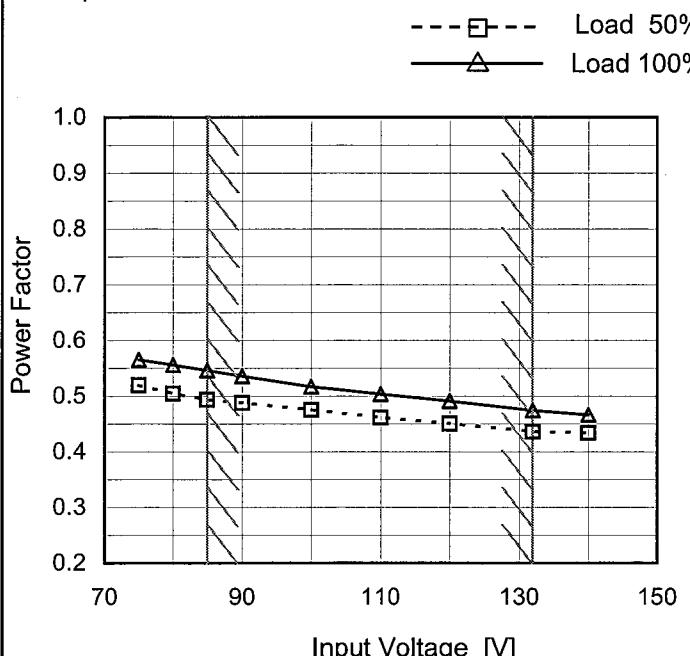
Model	MMC75B-3
Item	Efficiency (by Load Current)
Object	————————

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

△ Input Volt. 85V
□ Input Volt. 100V
○ Input Volt. 132V

2.Values

Load Ration [%]	Efficiency [%]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0	-	-	-
20	68.9	66.7	61.4
40	74.9	73.7	70.9
60	76.1	75.7	73.9
80	76.0	76.0	75.0
100	75.1	75.4	75.1
110	74.5	75.0	75.0
---	-	-	-
---	-	-	-
---	-	-	-
---	-	-	-

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Model	MMC75B-3
Item	Power Factor (by Input Voltage)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

- - -☐- - - Load 50%
———△——— Load 100%

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

2.Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
75	0.520	0.566
80	0.505	0.556
85	0.494	0.547
90	0.488	0.536
100	0.475	0.517
110	0.462	0.504
120	0.451	0.491
132	0.436	0.475
140	0.434	0.466

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Model	MMC75B-3
Item	Power Factor (by Load Current)
Object	————

Temperature 25°C
Testing Circuitry Figure A

1.Graph

— △ — Input Volt. 85V
--- ☐ --- Input Volt. 100V
— · ○ — · · Input Volt. 132V

Power Factor vs Load Ration [%]

2.Values

Load Ration [%]	Power Factor		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0	0.354	0.337	0.319
20	0.442	0.426	0.393
40	0.478	0.461	0.425
60	0.504	0.480	0.444
80	0.524	0.500	0.463
100	0.543	0.516	0.476
110	0.549	0.524	0.478
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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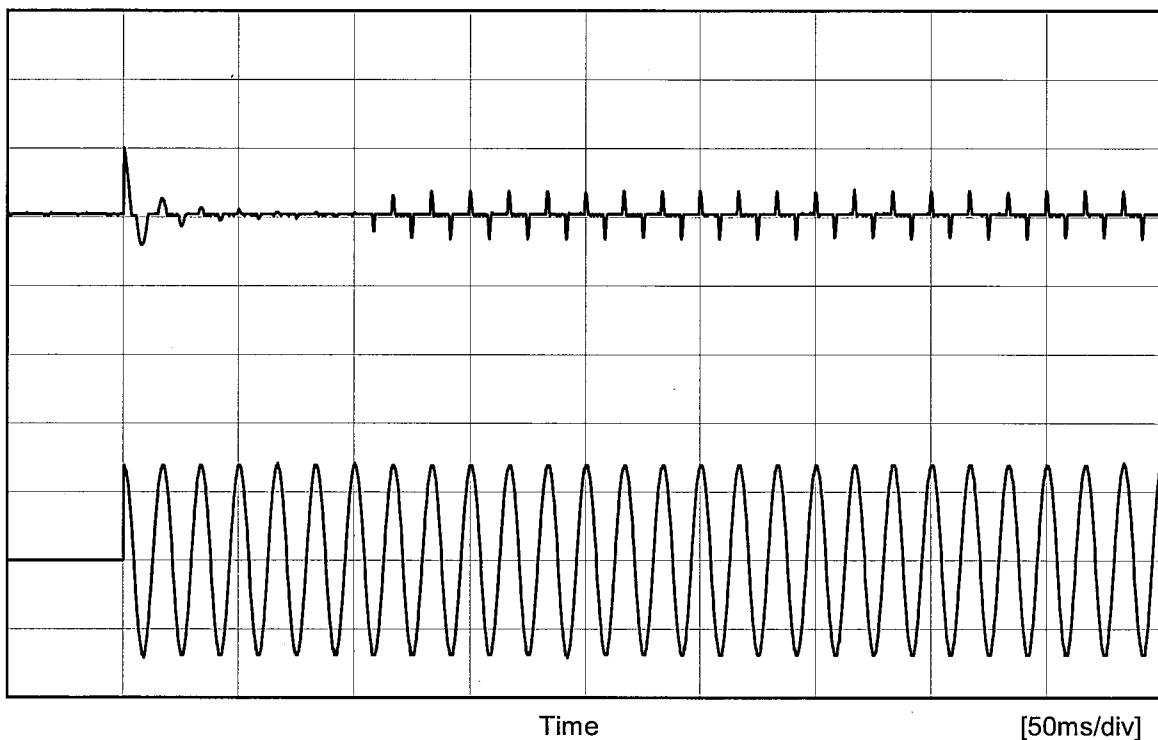
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Model	MMC75B-3
Item	Inrush Current
Object	————————

Temperature	25°C
Testing Circuitry	Figure A

Input Current [20A/div]

Input Voltage [100V/div]

Time   [50ms/div]
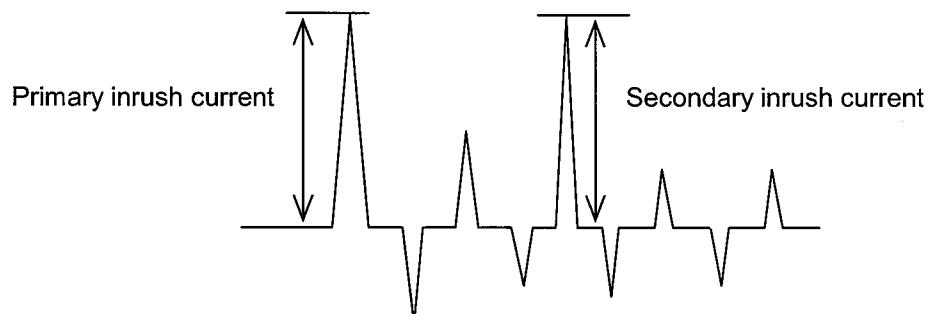
Input Voltage	100 V
Frequency	60 Hz
Load	100 %
Primary inrush current	19.4 A
Secondary inrush current	7.3 A

Primary inrush current   Secondary inrush current

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Model	MMC75B-3
Item	Leakage Current
Object	————————

Temperature 25°C
Testing Circuitry Figure B
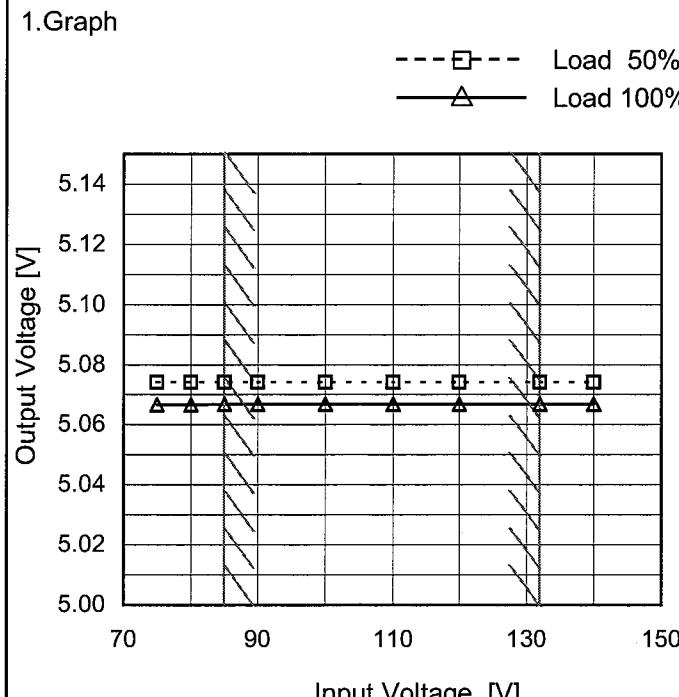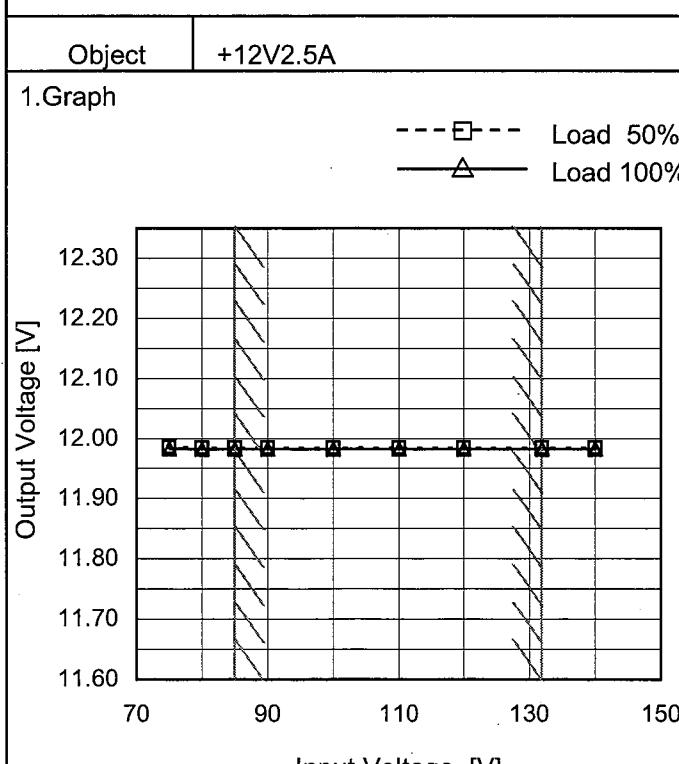
1.Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A)DEN-AN	0.11	0.13	0.18
(B)IEC60950-1	0.22	0.26	0.36

Standards	Leakage Current [mA]		
	Input Volt. 170 [V]	Input Volt. 240 [V]	Input Volt. 264 [V]
(B)IEC60950-1	-	-	-

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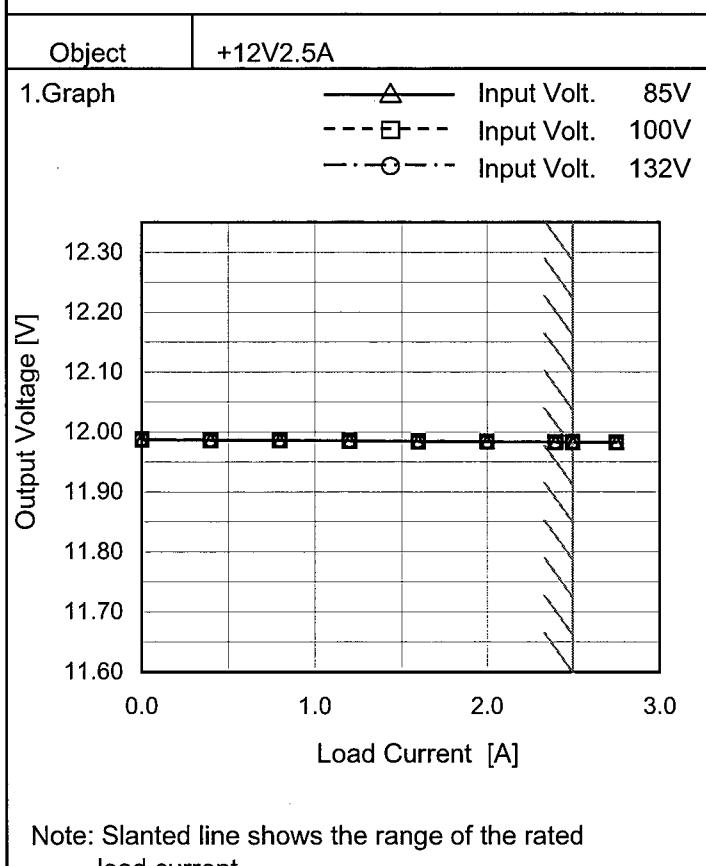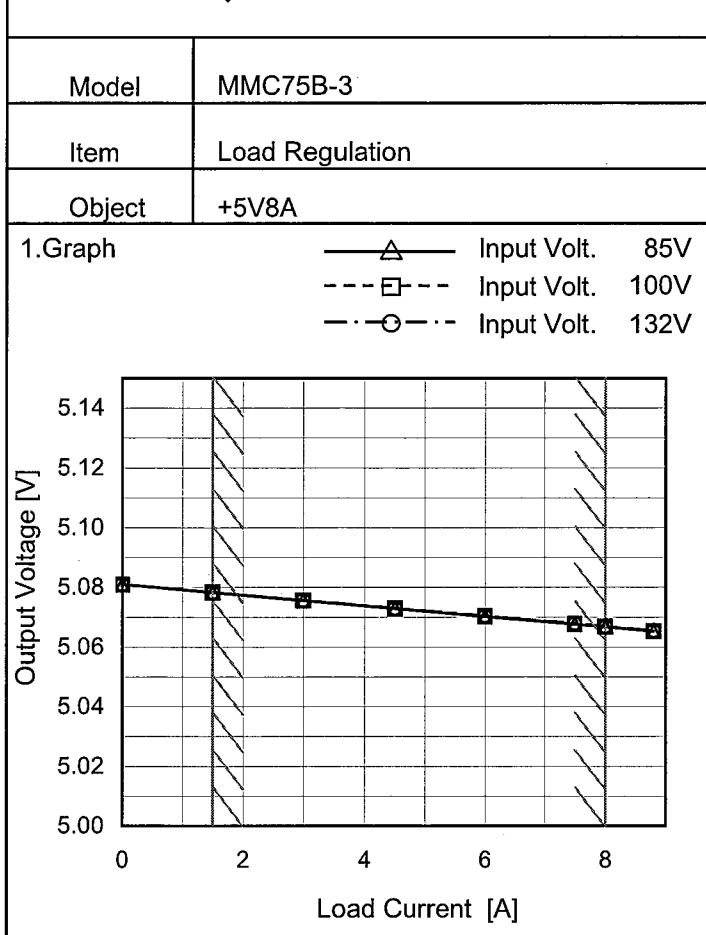
Leakage current value is concluded after measuring both phases of
AC input and by choosing the larger one.

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Model	MMC75B-3
Item	Line Regulation
Object	+5V8A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

- - -▱- - - Load 50%
———△——— Load 100%

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	5.074	5.067
80	5.074	5.067
85	5.074	5.067
90	5.074	5.067
100	5.074	5.067
110	5.074	5.067
120	5.074	5.067
132	5.074	5.067
140	5.074	5.067

Object	+12V2.5A

1.Graph

- - -▱- - - Load 50%
———△——— Load 100%

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	11.985	11.983
80	11.985	11.983
85	11.985	11.983
90	11.985	11.983
100	11.985	11.983
110	11.985	11.983
120	11.985	11.983
132	11.985	11.983
140	11.985	11.983

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

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Model	MMC75B-3
Item	Line Regulation
Object	-5V0.5A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

- - -◻- - - Load 50%
——△—— Load 100%

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

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
75	-5.012	-5.002
80	-5.012	-5.002
85	-5.012	-5.002
90	-5.012	-5.002
100	-5.012	-5.002
110	-5.012	-5.002
120	-5.012	-5.002
132	-5.012	-5.001
140	-5.012	-5.002

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Model	MMC75B-3
Item	Load Regulation
Object	+5V8A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

—△— Input Volt. 85V
- - -□- - - Input Volt. 100V
—·—○—·· Input Volt. 132V

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	5.081	5.081	5.081
1.5	5.078	5.078	5.078
3.0	5.076	5.076	5.076
4.5	5.073	5.073	5.073
6.0	5.070	5.070	5.070
7.5	5.068	5.068	5.068
8.0	5.067	5.067	5.067
8.8	5.065	5.065	5.065
--	-	-	-
--	-	-	-
--	-	-	-

Object	+12V2.5A

1.Graph

—△— Input Volt. 85V
- - -□- - - Input Volt. 100V
—·—○—·· Input Volt. 132V

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	11.988	11.988	11.988
0.40	11.987	11.987	11.986
0.80	11.986	11.986	11.986
1.20	11.985	11.985	11.985
1.60	11.985	11.984	11.984
2.00	11.984	11.984	11.984
2.40	11.983	11.983	11.983
2.50	11.983	11.983	11.983
2.75	11.983	11.982	11.982
--	-	-	-
--	-	-	-

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

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Model	MMC75B-3
Item	Load Regulation
Object	-5V0.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

——△—— Input Volt. 85V
- - -☐- - - Input Volt. 100V
—·-○—·· Input Volt. 132V

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

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	-5.022	-5.022	-5.022
0.08	-5.019	-5.019	-5.019
0.16	-5.015	-5.015	-5.015
0.24	-5.012	-5.012	-5.012
0.32	-5.009	-5.009	-5.009
0.40	-5.006	-5.006	-5.006
0.48	-5.002	-5.003	-5.002
0.50	-5.002	-5.002	-5.002
0.55	-5.000	-5.000	-5.000
--	-	-	-
--	-	-	-

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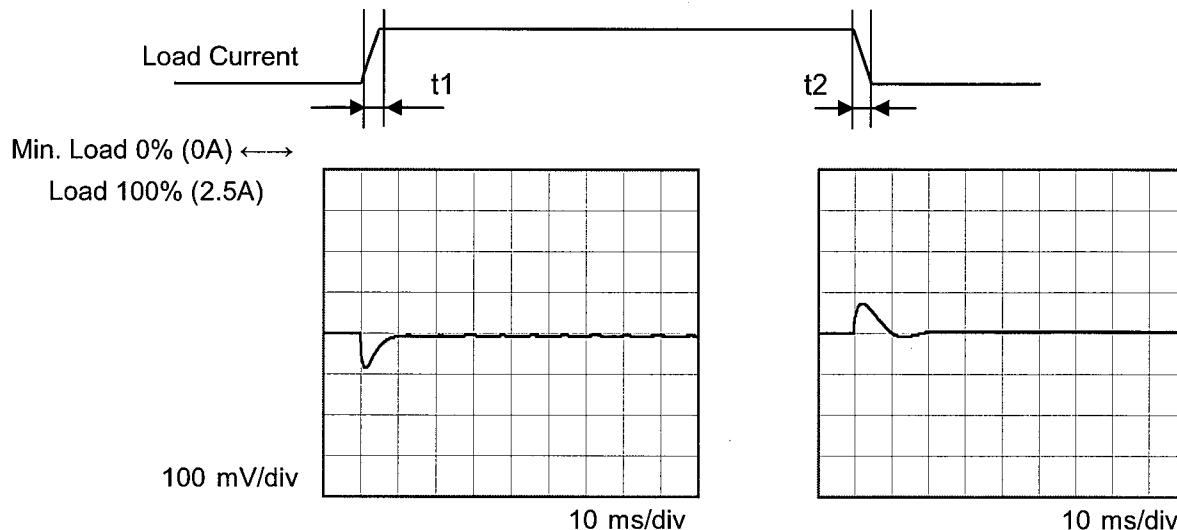
Model	MMC75B-3
Item	Dynamic Load Response
Object	+5V8A
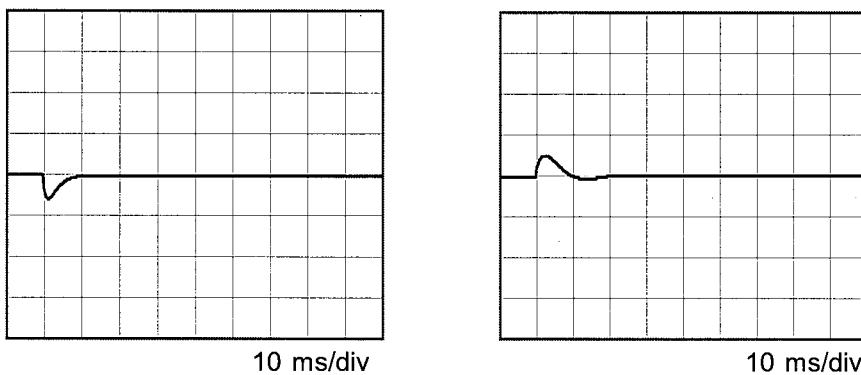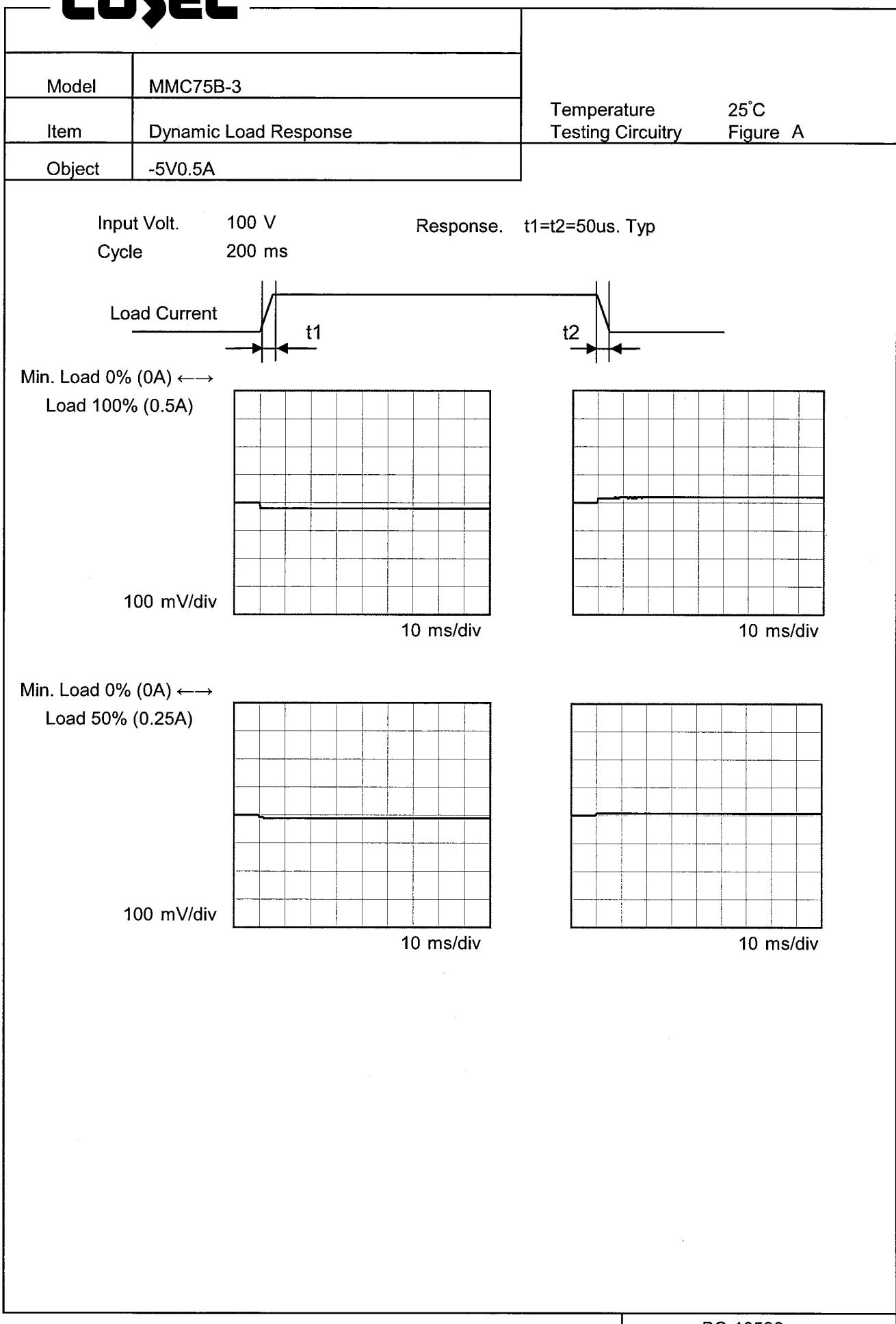
Temperature	25°C
Testing Circuitry	Figure A

Input Volt.   100 V   Response.   t1=t2=50us. Typ

Cycle   200 ms

Load Current   t1   t2

Min. Load 18.75% (1.5A) ←→

Load 100% (8A)

100 mV/div

10 ms/div   10 ms/div

Min. Load 18.75% (1.5A) ←→

Load 50% (4A)

100 mV/div

10 ms/div   10 ms/div

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Model	MMC75B-3		
Item	Dynamic Load Response	Temperature	25°C
		Testing Circuitry	Figure A
Object	+12V2.5A		

Input Volt.　　100 V　　　　　　　Response.　t1=t2=50us. Typ
Cycle　　　　　200 ms

Load Current

t1　　　　　　　t2

Min. Load 0% (0A) ←→
Load 100% (2.5A)

100 mV/div

10 ms/div　　　　　　　　　　　　10 ms/div

Min. Load 0% (0A) ←→
Load 50% (1.25A)

100 mV/div

10 ms/div　　　　　　　　　　　　10 ms/div

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Model	MMC75B-3		
Item	Dynamic Load Response	Temperature	25°C
		Testing Circuitry	Figure A
Object	-5V0.5A		

Input Volt. 100 V   Response. t1=t2=50us. Typ
Cycle   200 ms

Load Current   t1   t2

Min. Load 0% (0A) ←→
Load 100% (0.5A)

100 mV/div   10 ms/div   10 ms/div

Min. Load 0% (0A) ←→
Load 50% (0.25A)

100 mV/div   10 ms/div   10 ms/div

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Model	MMC75B-3
Item	Ripple Voltage (by Load Current)
Object	+5V8A

Temperature 25°C
Testing Circuitry Figure B

1.Graph

— △ — Input Volt. 85V
— ·O— ·· Input Volt. 132V

Load Current [A]

Measured by 20 MHz Oscilloscope.
Ripple Voltage 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 Voltage [mV]	
	Input Volt. 85 [V]	Input Volt. 132 [V]
0.0	15	20
1.6	20	25
3.2	20	25
4.8	20	25
6.4	25	25
8.0	25	25
8.8	25	25
--	-	-
--	-	-
--	-	-
--	-	-

T1: Due to AC Input Line
T2: Due to Switching

Ripple [mVp-p]

Fig. Complex Ripple Wave Form

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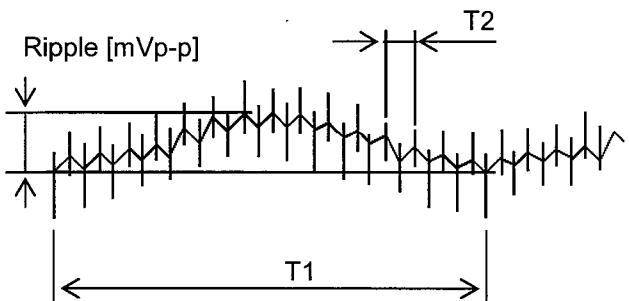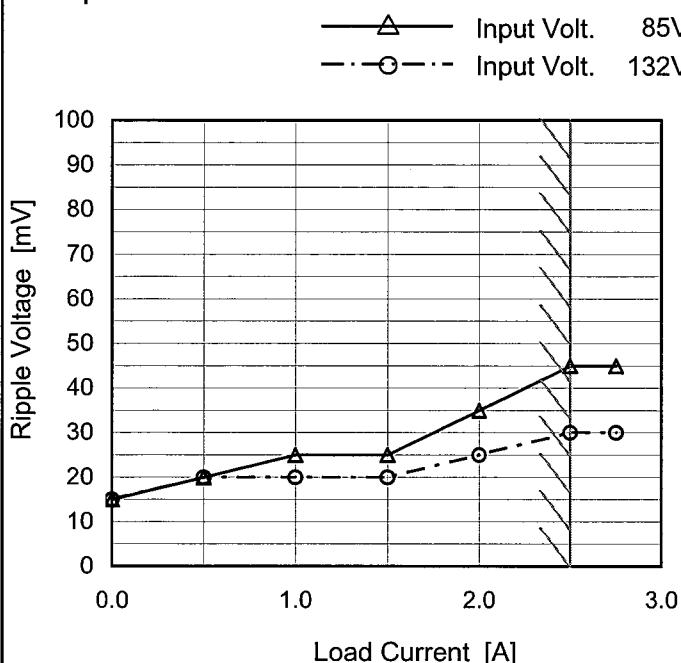
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Model	MMC75B-3
Item	Ripple Voltage (by Load Current)
Object	+12V2.5A

Temperature   25°C
Testing Circuitry   Figure B

1.Graph

——△—— Input Volt.   85V
—·—○—·· Input Volt.   132V

Load Current [A]

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 85 [V]	Input Volt. 132 [V]
0.00	15	15
0.50	20	20
1.00	25	20
1.50	25	20
2.00	35	25
2.50	45	30
2.75	45	30
--	-	-
--	-	-
--	-	-
--	-	-

Measured by MHz Oscilloscope.
Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated
load current.

T1: Due to AC Input Line
T2: Due to Switching

Ripple [mVp-p]

Fig. Complex Ripple Wave Form

BC-10538
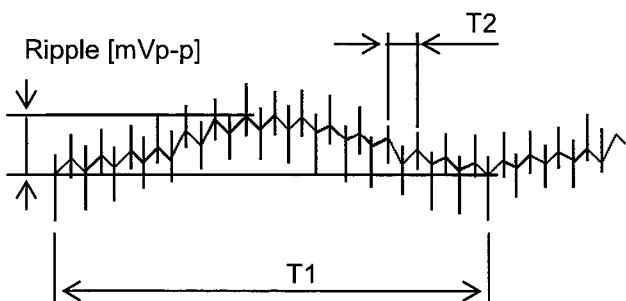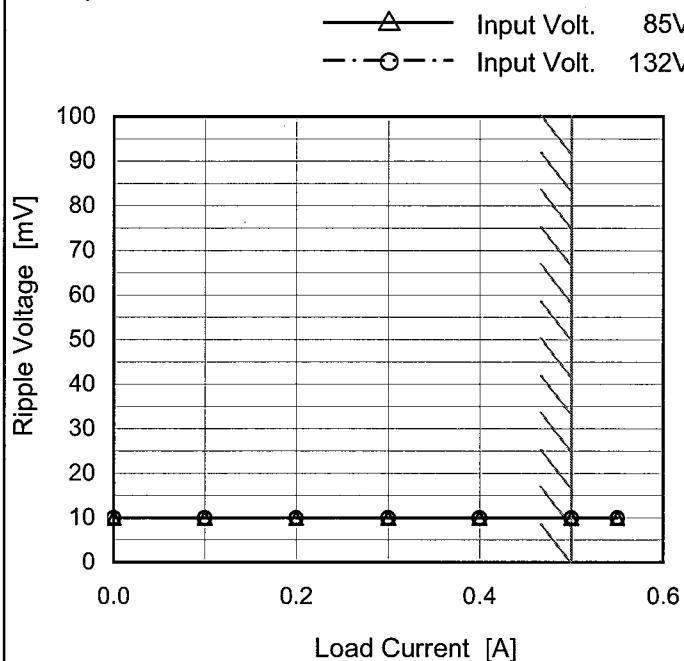
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Model	MMC75B-3
Item	Ripple Voltage (by Load Current)
Object	-5V0.5A

Temperature 25°C
Testing Circuitry Figure B

1.Graph

———△——— Input Volt. 85V
— · —O— · · Input Volt. 132V

Load Current [A]

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 85 [V]	Input Volt. 132 [V]
0.000	10	10
0.100	10	10
0.200	10	10
0.300	10	10
0.400	10	10
0.500	10	10
0.550	10	10
--	-	-
--	-	-
--	-	-
--	-	-

Measured by MHz Oscilloscope.
Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated
       load current.

T1: Due to AC Input Line
T2: Due to Switching

Ripple [mVp-p]

Fig. Complex Ripple Wave Form

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Model	MMC75B-3
Item	Ripple-Noise
Object	+5V8A

Temperature 25°C
Testing Circuitry Figure B

1.Graph

——△—— Input Volt. 85V
—·—○—·· Input Volt. 132V

Ripple-Noise [mV] vs Load Current [A]

Measured by 20 MHz Oscilloscope.
Ripple-Noise is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated
        load current.
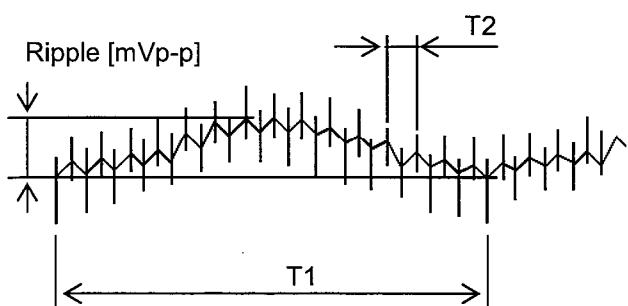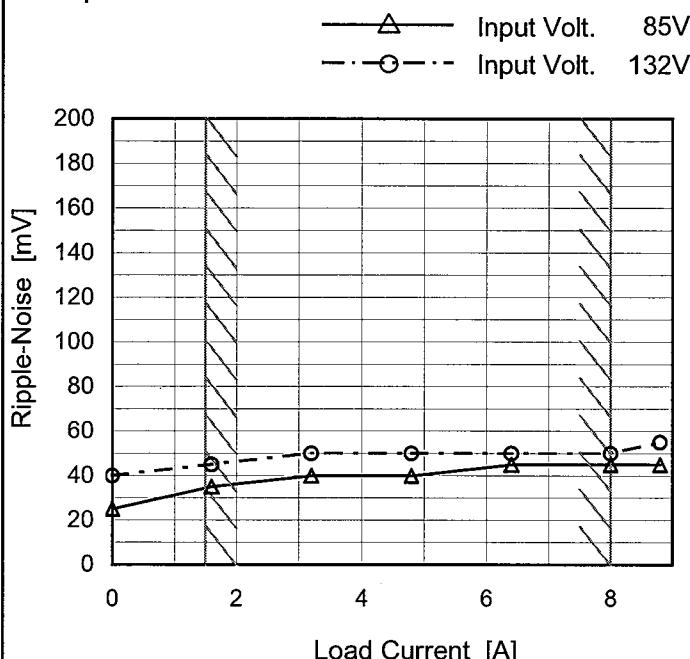
2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 85 [V]	Input Volt. 132 [V]
0.0	25	40
1.6	35	45
3.2	40	50
4.8	40	50
6.4	45	50
8.0	45	50
8.8	45	55
--	-	-
--	-	-
--	-	-
--	-	-

T1: Due to AC Input Line
T2: Due to Switching

Ripple-Noise
[mVp-p]

T2

T1

Fig. Complex Ripple Wave Form

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Model	MMC75B-3
Item	Ripple-Noise
Object	+12V2.5A

Temperature 25°C
Testing Circuitry Figure B

1.Graph

——△—— Input Volt. 85V
—·—○—··— Input Volt. 132V

Ripple-Noise [mV]

Load Current [A]

Measured by 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. 85 [V]	Input Volt. 132 [V]
0.00	35	40
0.50	35	40
1.00	40	45
1.50	40	45
2.00	60	60
2.50	75	70
2.75	75	70
--	-	-
--	-	-
--	-	-
--	-	-

T1: Due to AC Input Line
T2: Due to Switching

Ripple-Noise
[mVp-p]

T2

T1

Fig. Complex Ripple Wave Form

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Model	MMC75B-3
Item	Ripple-Noise
Object	-5V0.5A

Temperature　　25°C
Testing Circuitry　Figure B

1.Graph

———△——— Input Volt.　85V
—·—○—·— Input Volt.　132V

Ripple-Noise [mV] vs Load Current [A]

Measured by 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
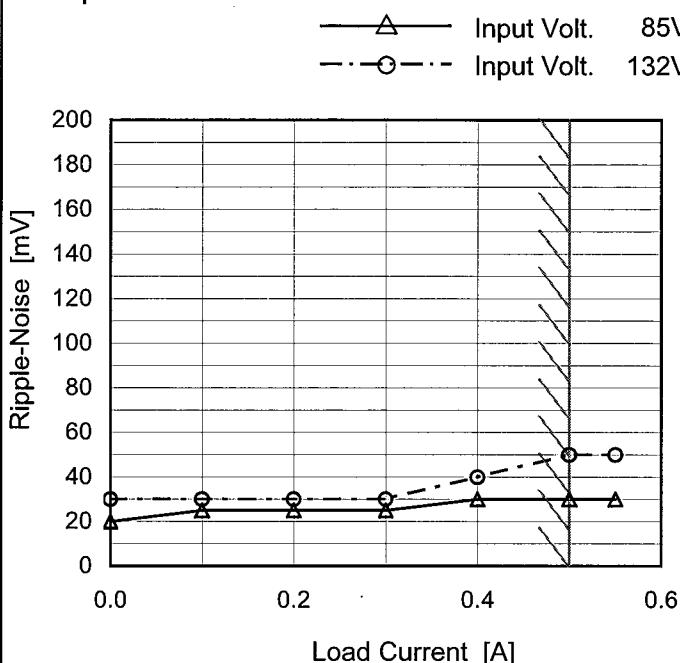
Load Current [A]	Ripple-Noise [mV] Input Volt. 85 [V]	Input Volt. 132 [V]
0.000	20	30
0.100	25	30
0.200	25	30
0.300	25	30
0.400	30	40
0.500	30	50
0.550	30	50
--	-	-
--	-	-
--	-	-
--	-	-

T1: Due to AC Input Line
T2: Due to Switching
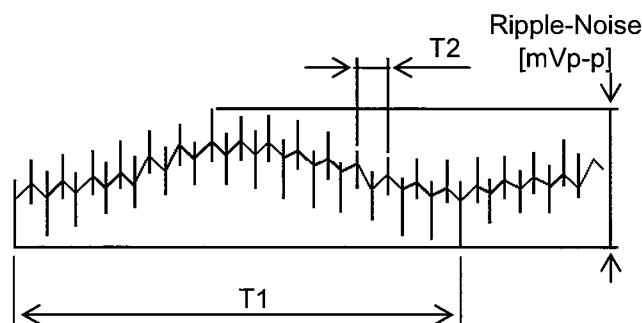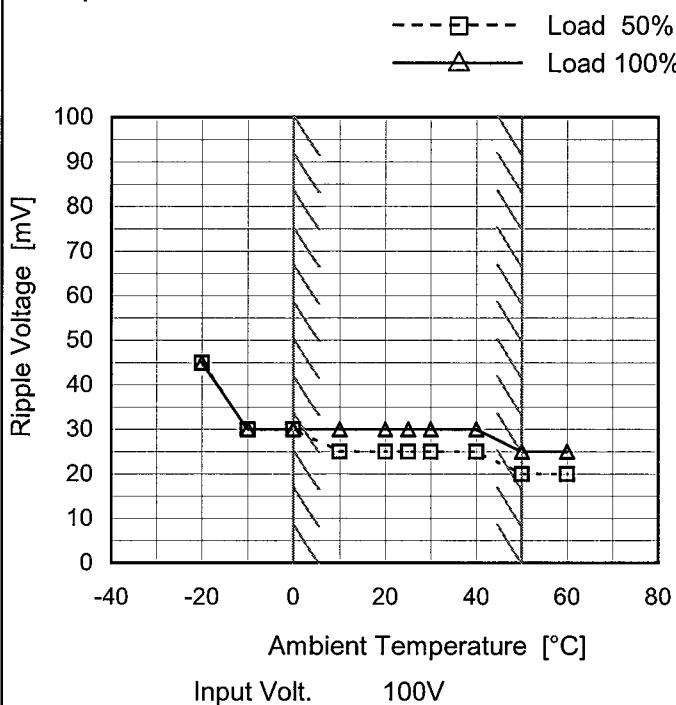
Ripple-Noise [mVp-p]

Fig. Complex Ripple Wave Form

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Model	MMC75B-3
Item	Ripple Voltage (by Ambient Temp.)
Object	+5V8A

Testing Circuitry   Figure A

1.Graph

---⊟--- Load 50%
——△—— Load 100%

Ambient Temperature [°C]

Input Volt.   100V
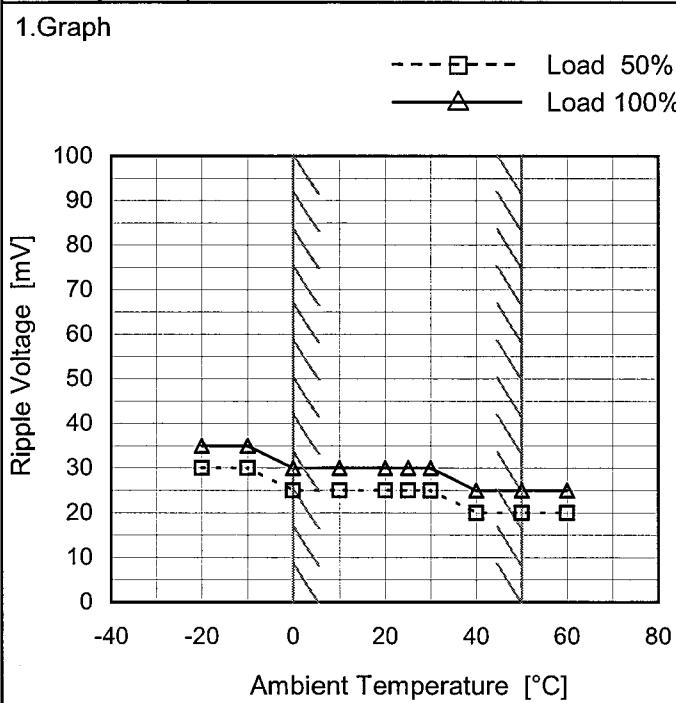
2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-20	45	45
-10	30	30
0	30	30
10	25	30
20	25	30
25	25	30
30	25	30
40	25	30
50	20	25
60	20	25
--	-	-

Object	+12V2.5A

1.Graph

---⊟--- Load 50%
——△—— Load 100%

Ambient Temperature [°C]

Input Volt.   100V

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	30	35
-10	30	35
0	25	30
10	25	30
20	25	30
25	25	30
30	25	30
40	20	25
50	20	25
60	20	25
--	-	-
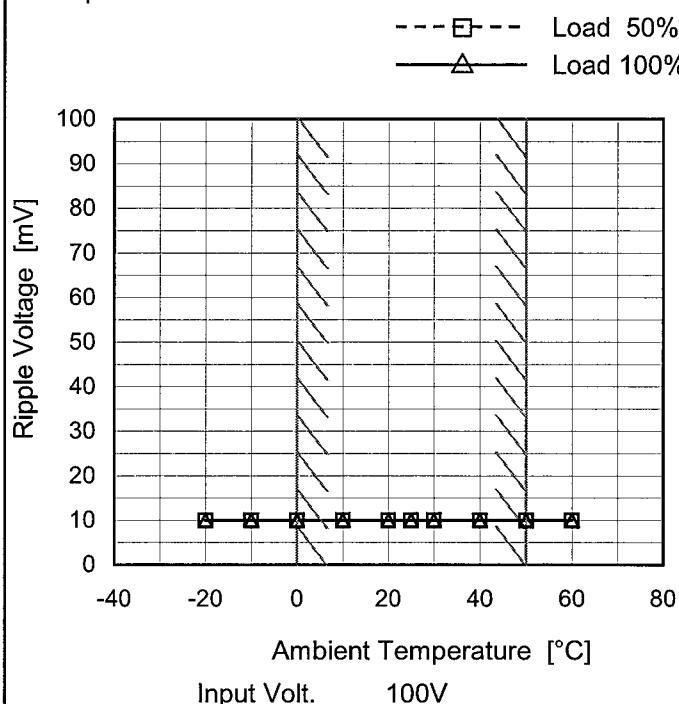
BC-10538

CO$EL

Model	MMC75B-3
Item	Ripple Voltage (by Ambient Temp.)
Object	-5V0.5A

Testing Circuitry   Figure A

1.Graph

- - -☐- - -   Load 50%
———△———   Load 100%

Ambient Temperature [°C]

Input Volt.   100V

Measured by 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	10	10
-10	10	10
0	10	10
10	10	10
20	10	10
25	10	10
30	10	10
40	10	10
50	10	10
60	10	10
--	-	-
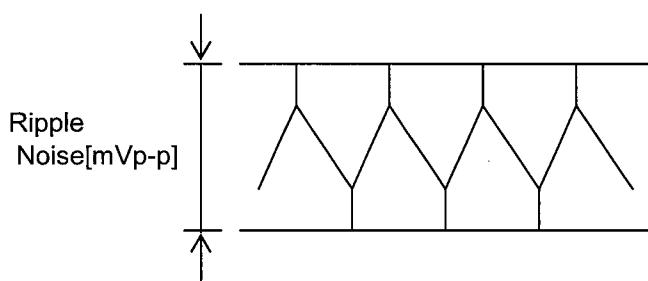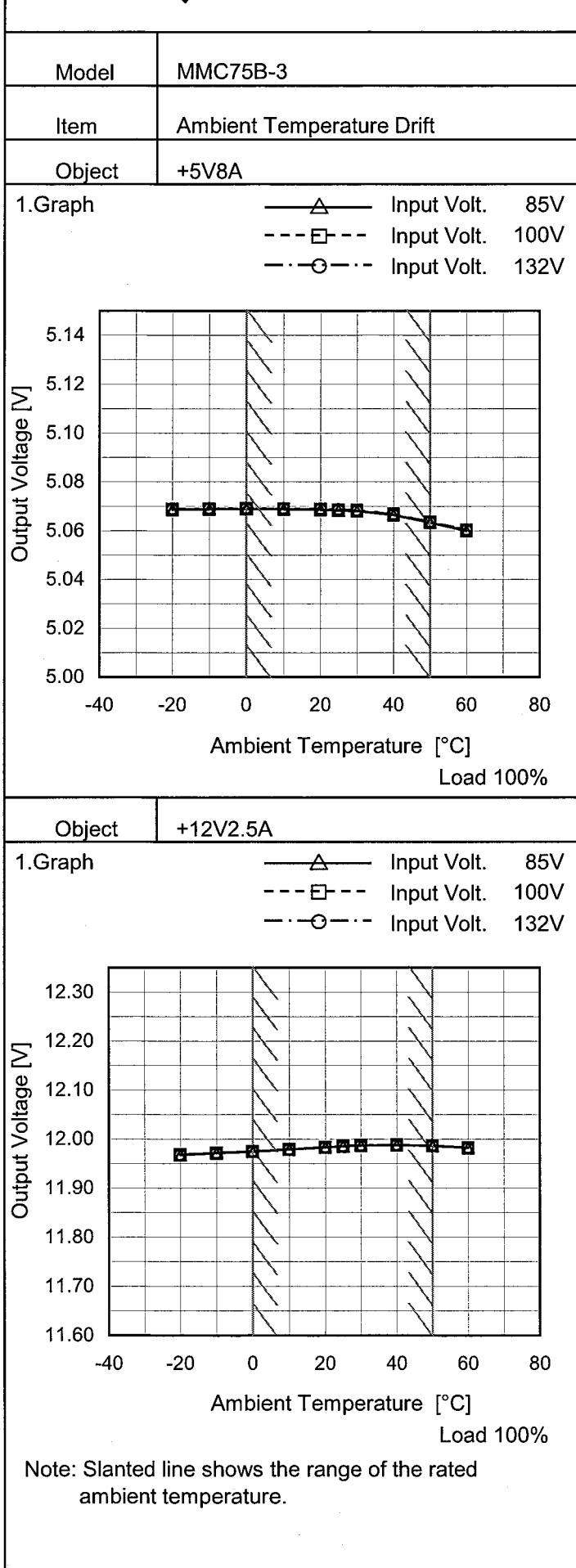
Ripple
Noise[mVp-p]

Fig.Complex Ripple Noise Wave Form
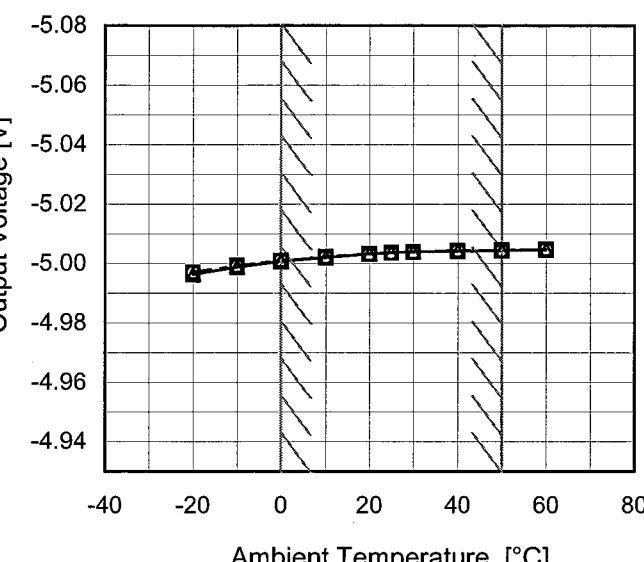
BC-10538

COSEL

Model	MMC75B-3
Item	Ambient Temperature Drift
Object	+5V8A

Testing Circuitry   Figure A

1.Graph

———△——— Input Volt.   85V
- - -☐- - - Input Volt.   100V
—·—○—·— Input Volt.   132V

Ambient Temperature [°C]

Load 100%

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	5.069	5.069	5.069
-10	5.069	5.069	5.069
0	5.069	5.069	5.069
10	5.069	5.069	5.069
20	5.069	5.069	5.069
25	5.068	5.069	5.069
30	5.068	5.068	5.068
40	5.067	5.067	5.067
50	5.063	5.064	5.064
60	5.060	5.060	5.060
--	-	-	-

Object	+12V2.5A

1.Graph

———△——— Input Volt.   85V
- - -☐- - - Input Volt.   100V
—·—○—·— Input Volt.   132V

Ambient Temperature [°C]

Load 100%

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	11.968	11.968	11.968
-10	11.972	11.971	11.971
0	11.975	11.975	11.975
10	11.979	11.979	11.979
20	11.984	11.983	11.983
25	11.985	11.985	11.985
30	11.987	11.987	11.987
40	11.988	11.988	11.988
50	11.987	11.987	11.986
60	11.982	11.982	11.982
--	-	-	-

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

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CO$EL

Model	MMC75B-3
Item	Ambient Temperature Drift
Object	-5V0.5A

Testing Circuitry   Figure A

1.Graph

———△——— Input Volt.   85V
---◻--- Input Volt.   100V
—·—○—·— Input Volt.   132V

Output Voltage [V]

Ambient Temperature [°C]

Load 100%

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

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	-4.996	-4.997	-4.997
-10	-4.999	-4.999	-4.999
0	-5.001	-5.001	-5.001
10	-5.002	-5.002	-5.002
20	-5.003	-5.003	-5.003
25	-5.004	-5.004	-5.004
30	-5.004	-5.004	-5.004
40	-5.004	-5.004	-5.004
50	-5.005	-5.005	-5.005
60	-5.005	-5.005	-5.005
--	-	-	-

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COSEL

Model	MMC75B-3		
Item	Output Voltage Accuracy	Testing Circuitry	Figure A

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 - 2.5A   (AVR 3) : 0 - 0.5A

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

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

2.Values

Object	+5V8A				
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	20	100	1.5	5.080	±9	±0.2
Minimum Voltage	50	85	8	5.063		
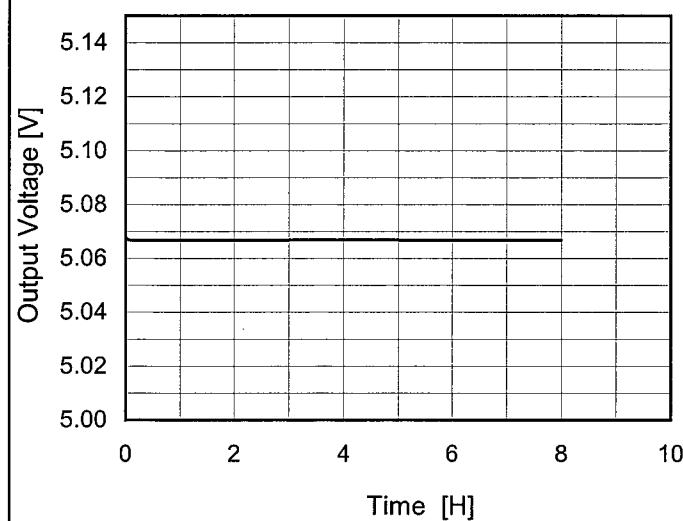
Object	+12V2.5A				
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	40	100	0	11.993	±10	±0.1
Minimum Voltage	0	85	2.5	11.974		

Object	-5V0.5A				
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	50	85	0	-5.027	±21	±0.4
Minimum Voltage	0	85	0.5	-4.985		

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COSEL

Model	MMC75B-3
Item	Time Lapse Drift
Object	+5V8A
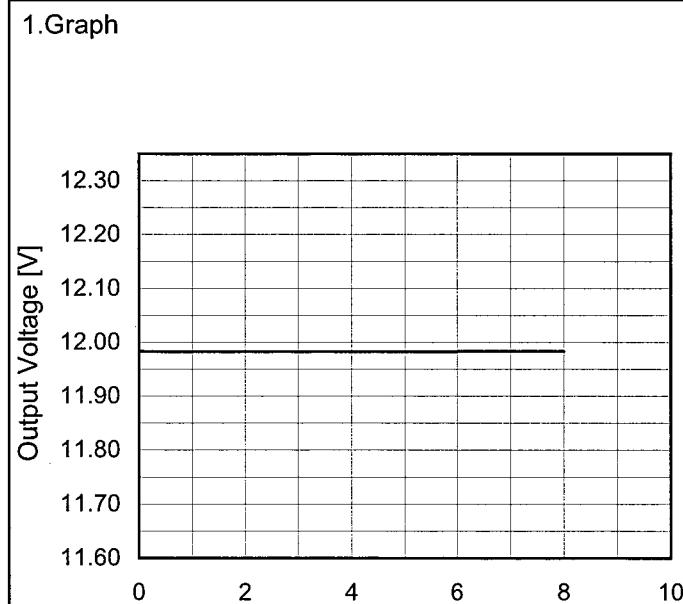
Temperature 25°C
Testing Circuitry Figure A

1.Graph

Time [H]
Input Volt. 100V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	5.068
0.5	5.067
1.0	5.067
2.0	5.067
3.0	5.067
4.0	5.067
5.0	5.067
6.0	5.067
7.0	5.067
8.0	5.067

Object	+12V2.5A

1.Graph

Time [H]
Input Volt. 100V
Load 100%
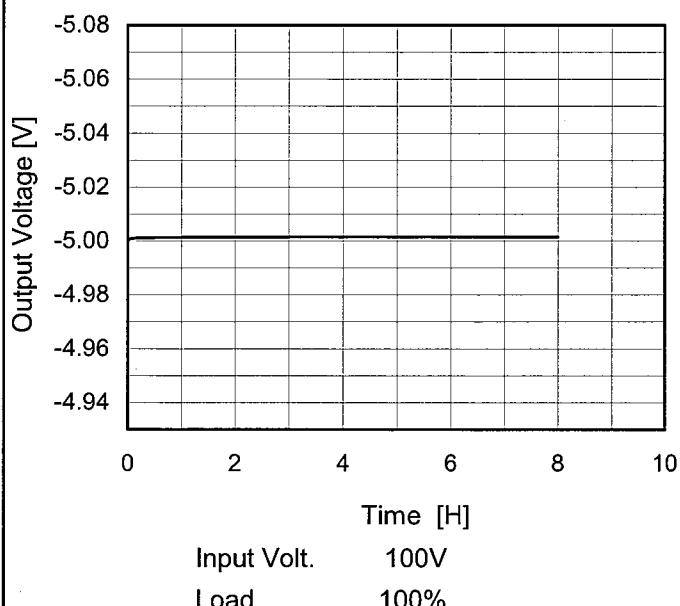
2.Values

Time since start [H]	Output Voltage [V]
0.0	11.983
0.5	11.983
1.0	11.983
2.0	11.983
3.0	11.983
4.0	11.983
5.0	11.983
6.0	11.983
7.0	11.983
8.0	11.983

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COSEL

Model	MMC75B-3
Item	Time Lapse Drift
Object	-5V0.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

Input Volt. 100V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	-5.000
0.5	-5.001
1.0	-5.001
2.0	-5.001
3.0	-5.002
4.0	-5.002
5.0	-5.002
6.0	-5.002
7.0	-5.002
8.0	-5.002
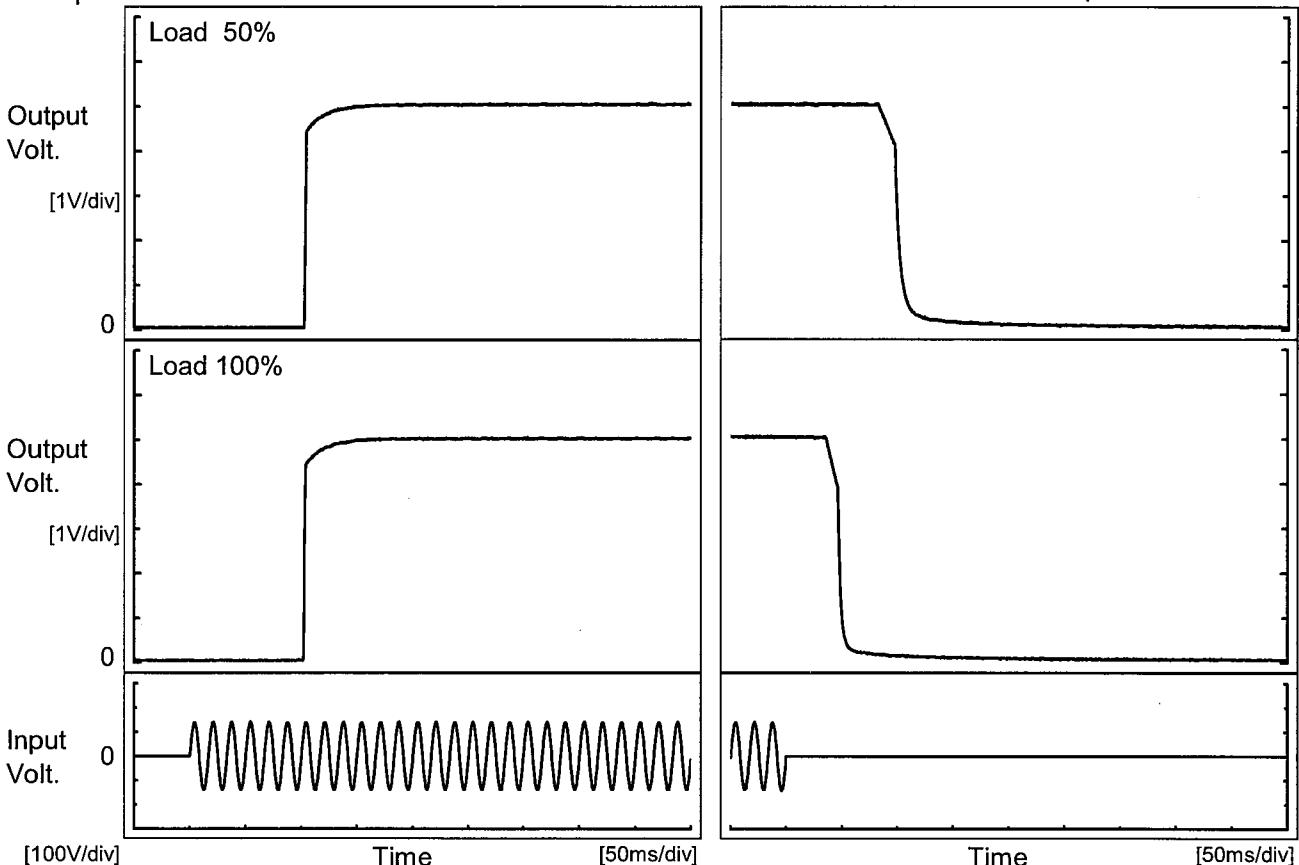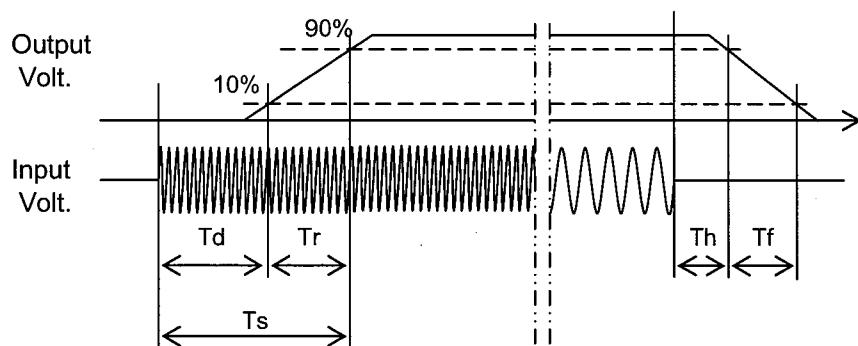
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CO$EL

Model	MMC75B-3		
Item	Rise and Fall Time	Temperature	25°C
		Testing Circuitry	Figure A
Object	+5V8A		

1.Graph   Input Volt.   100 V

Load 50%

Output Volt.
[1V/div]

0

Load 100%

Output Volt.
[1V/div]

0

Input Volt.
0

[100V/div]   Time   [50ms/div]   Time   [50ms/div]

2.Values   [ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	103.3	4.3	107.6	90.3	19.5
100 %	102.5	4.5	107.0	40.5	12.3
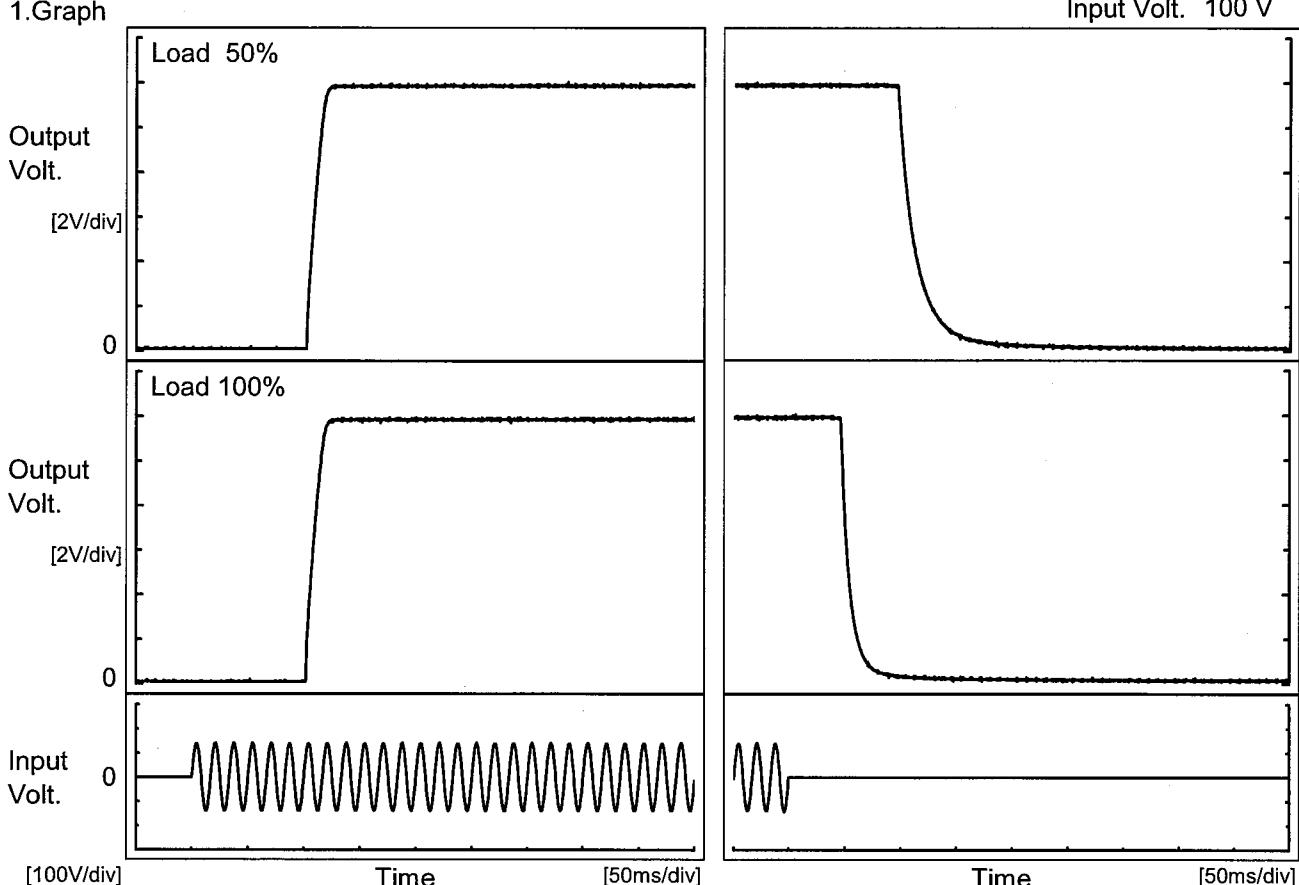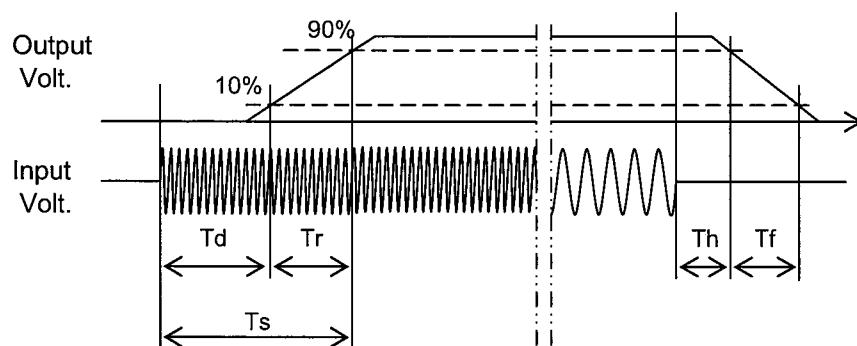
Output Volt.
90%
10%

Input Volt.

Td   Tr   Th Tf
Ts

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COSEL

Model	MMC75B-3
Item	Rise and Fall Time
Object	+12V2.5A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

Input Volt.   100 V

Load 50%

Output
Volt.

[2V/div]

0

Load 100%

Output
Volt.

[2V/div]

0

Input
Volt.

0

[100V/div]   Time   [50ms/div]   Time   [50ms/div]

2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	103.3	14.8	118.1	98.5	37.8
100 %	102.5	15.3	117.8	47.0	19.5
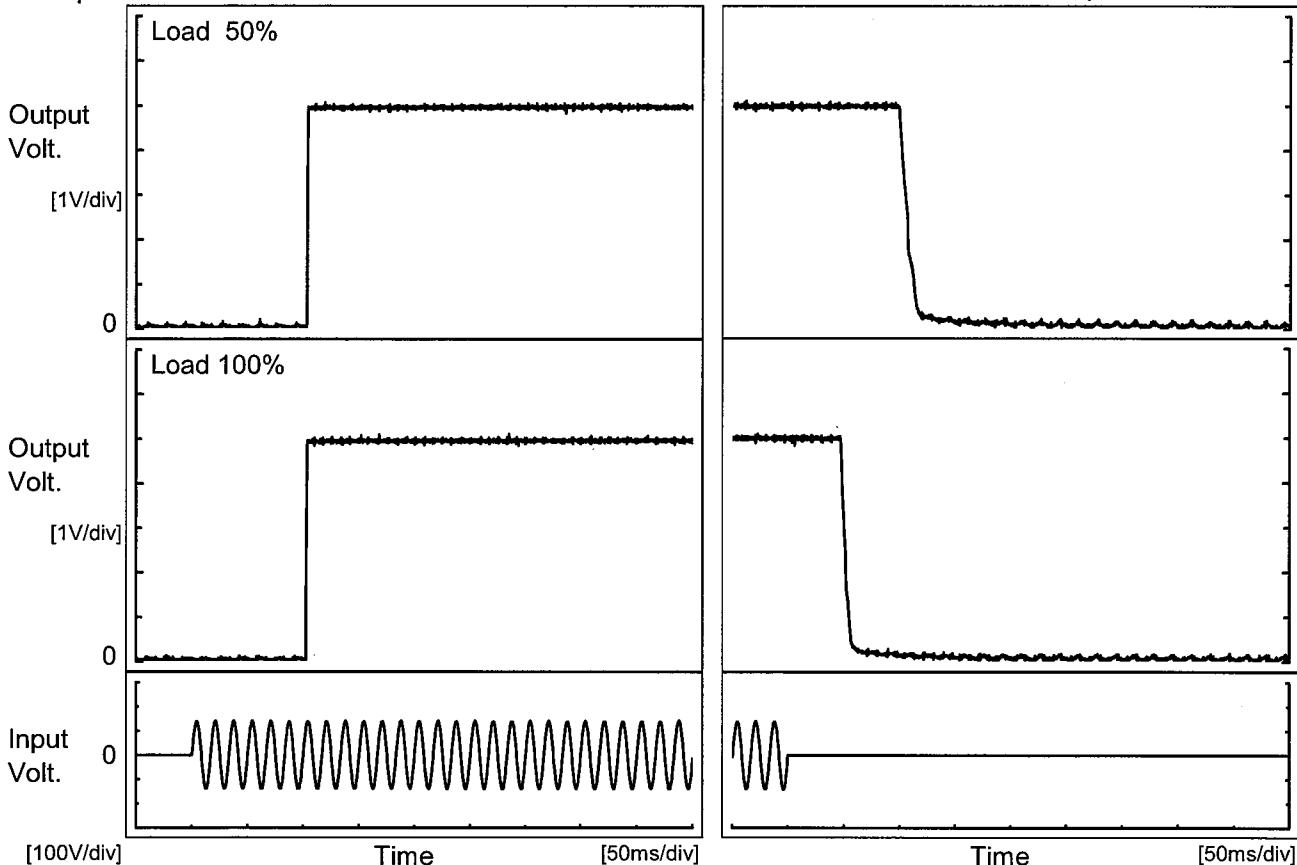
Output
Volt.

90%

10%

Input
Volt.

Td Tr   Th Tf

Ts

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CO$EL

Model	MMC75B-3

Item	Rise and Fall Time

Object	-5V0.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

Input Volt. 100 V

Load 50%

Output
Volt.

[1V/div]

0

Load 100%

Output
Volt.

[1V/div]

0

Input
Volt.

0

[100V/div]   Time   [50ms/div]   Time   [50ms/div]

2.Values

[ms]
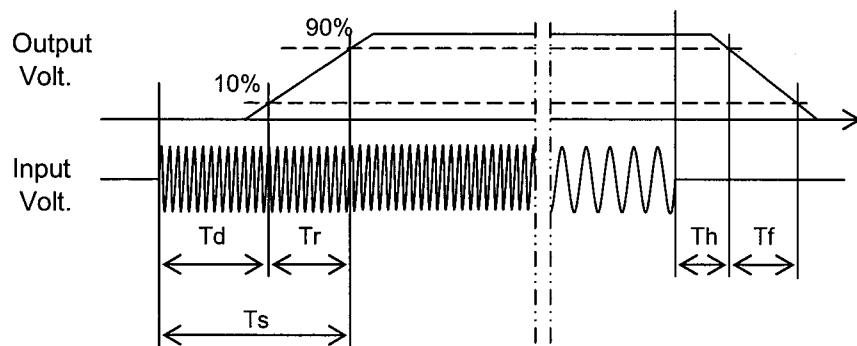
Load \ Time	Td	Tr	Ts	Th	Tf
50 %	103.8	0.5	104.3	100.0	14.5
100 %	103.0	0.5	103.5	47.8	8.5

Output
Volt.

90%

10%

Input
Volt.

Td   Tr   Th   Tf

Ts

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CO$EL

Model	MMC75B-3
Item	Hold-Up Time
Object	+5V8A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

- - - ▫ - - -   Load 50%
————△————   Load 100%

Hold-Up Time [ms]

Input Voltage [V]

2.Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
75	25	7
80	35	12
85	46	18
90	57	24
100	83	37
110	111	51
120	142	66
132	183	87
140	213	102

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.

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CO$EL

Model	MMC75B-3
Item	Hold-Up Time
Object	+12V2.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

- - - ⊟ - - - Load 50%
———△——— Load 100%

Hold-Up Time [ms] vs Input Voltage [V]

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.
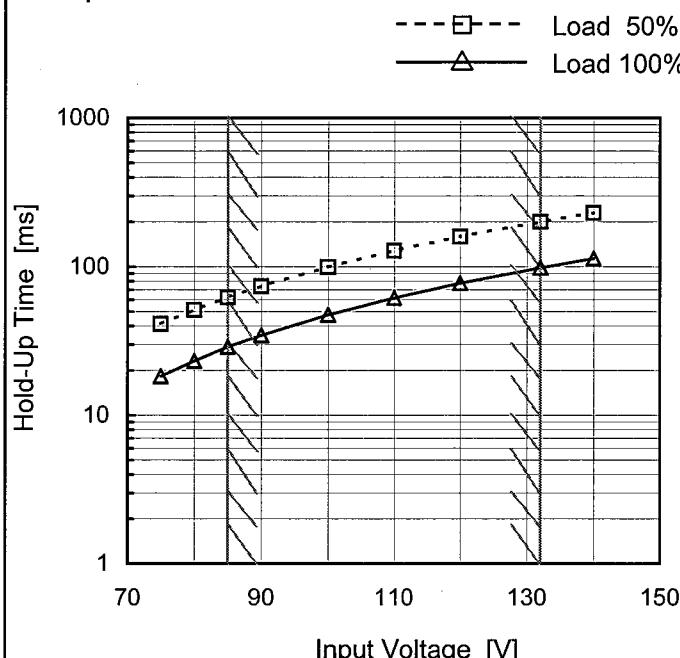
2.Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
75	39	17
80	49	22
85	60	28
90	71	34
100	97	46
110	125	61
120	157	76
132	198	97
140	228	112

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CO$EL

Model	MMC75B-3
Item	Hold-Up Time
Object	-5V0.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

- - -▢- - - Load 50%
——△—— Load 100%

Input Voltage [V]

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	41	18
80	51	23
85	62	29
90	74	35
100	99	48
110	128	62
120	159	78
132	201	98
140	230	114

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CO$EL

Model	MMC75B-3
Item	Instantaneous Interruption Compensation
Object	+5V8A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

—△— Input Volt. 85V
---◻--- Input Volt. 100V
—·—○—·· Input Volt. 132V

Instantaneous Compensation Time [ms]

Load Current [A]

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

2.Values

Load Current [A]	Time [ms]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	-	-	-
1.5	44	78	170
3.0	35	63	141
4.5	28	54	121
6.0	22	46	105
7.5	19	39	92
8.0	18	37	88
8.8	17	34	83
--	-	-	-
--	-	-	-
--	-	-	-

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CO$EL

Model	MMC75B-3
Item	Instantaneous Interruption Compensation
Object	+12V2.5A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph
————△———— Input Volt.   85V
– – –▱– – – Input Volt.   100V
— · –◯— · · Input Volt.   132V

Instantaneous Compensation Time [ms] vs Load Current [A]

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

2.Values

Load Current [A]	Time [ms]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	-	-	-
0.40	44	72	147
0.80	39	64	134
1.20	36	57	123
1.60	31	55	115
2.00	30	48	106
2.40	27	47	98
2.50	27	46	98
2.75	22	44	93
--	-	-	-
--	-	-	-

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COSEL

Model	MMC75B-3
Item	Instantaneous Interruption Compensation
Object	-5V0.5A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

———△——— Input Volt. 85V
— — —□— — — Input Volt. 100V
—·—○—··— Input Volt. 132V

Instantaneous Compensation Time [ms] vs Load Current [A]

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

2.Values

Load Current [A]	Time [ms]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.00	-	-	-
0.08	28	48	102
0.16	28	48	101
0.24	28	47	98
0.32	28	47	98
0.40	27	46	98
0.48	27	46	97
0.50	27	46	97
0.55	27	45	97
--	-	-	-
--	-	-	-

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CO$EL

Model	MMC75B-3
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+5V8A

Testing Circuitry   Figure A

1.Graph

--- ⊟ --- Load 50%
—— △ —— Load 100%

Input Voltage [V] vs Ambient Temperature [°C]

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	61	67
-10	61	67
0	61	67
10	61	67
20	61	67
25	61	67
30	61	67
40	61	67
50	61	67
60	61	67
--	-	-

Object	+12V2.5A

1.Graph

--- ⊟ --- Load 50%
—— △ —— Load 100%

Input Voltage [V] vs Ambient Temperature [°C]

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	58	62
-10	58	62
0	58	62
10	57	62
20	56	62
25	57	62
30	56	62
40	56	62
50	56	62
60	56	62
--	-	-

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

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CO$EL

Model	MMC75B-3
Item	Minimum Input Voltage for Regulated Output Voltage
Object	-5V0.5A

Testing Circuitry　Figure A

1.Graph

--- ⊟ --- Load 50%
——△—— Load 100%

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

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	58	62
-10	59	62
0	58	62
10	56	62
20	56	62
25	57	62
30	56	62
40	56	62
50	56	62
60	56	62
--	-	-

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COSEL

Model	MMC75B-3
Item	Overcurrent Protection
Object	+5V8A

Temperature 25°C
Testing Circuitry Figure A

1.Graph
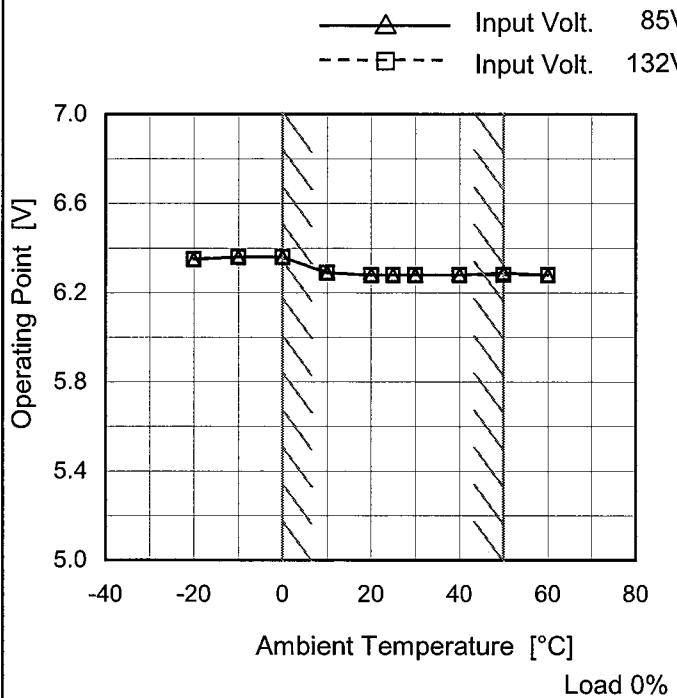
——— Input Volt. 85V
——— Input Volt. 100V
~~~~~~~ Input Volt. 132V

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
4.75	12.03	12.24	12.59
4.50	12.07	12.23	12.54
4.00	12.06	12.17	12.41
3.50	12.02	12.12	12.23
3.00	12.82	12.85	12.99
2.50	13.80	13.87	14.00
2.00	14.72	14.79	15.02
1.50	15.71	15.77	15.92
1.00	16.76	16.80	16.96
0.50	17.57	17.58	17.76
0.00	18.35	18.33	18.39
--	-	-	-

Object	+12V2.5A

1.Graph

——— Input Volt. 85V
——— Input Volt. 100V
~~~~~~~ Input Volt. 132V

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

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
11.40	4.44	4.50	4.59
10.80	4.53	4.57	4.68
9.60	4.76	4.80	4.94
8.40	4.99	5.06	5.19
7.20	5.23	5.30	5.44
6.00	5.47	5.58	5.73
4.80	5.76	5.82	5.95
3.60	6.00	6.06	6.19
2.40	6.17	6.22	6.33
1.20	6.29	6.32	6.39
0.00	6.41	6.47	6.66
--	-	-	-

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CO$EL

Model	MMC75B-3
Item	Overcurrent Protection
Object	-5V0.5A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

——— Input Volt. 85V
——— Input Volt. 100V
········· Input Volt. 132V

Output Voltage [V] vs Load Current [A]

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

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 85[V]	Input Volt. 100[V]	Input Volt. 132[V]
-4.8	1.55	1.52	1.52
-4.5	1.52	1.49	1.49
-4.0	1.48	1.45	1.45
-3.5	1.43	1.41	1.41
-3.0	1.39	1.38	1.37
-2.5	1.36	1.35	1.35
-2.0	1.33	1.32	1.32
-1.5	1.31	1.30	1.30
-1.0	1.29	1.28	1.28
-0.5	1.26	1.25	1.25
0.0	1.20	1.20	1.20
--	-	-	-

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CO$EL

Model	MMC75B-3

Item	Overvoltage Protection

Object	+5V8A

Testing Circuitry   Figure A

1.Graph

——△—— Input Volt.   85V
---🖯--- Input Volt.   132V

Operating Point [V] vs Ambient Temperature [°C]

Load 0%

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

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 85[V]	Input Volt. 132[V]
-20	6.35	6.35
-10	6.36	6.36
0	6.36	6.36
10	6.29	6.29
20	6.28	6.28
25	6.28	6.28
30	6.28	6.28
40	6.28	6.28
50	6.29	6.28
60	6.28	6.28
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Figure A

$$\text{Leakage Current Value } [A] = \frac{\text{Effective Value of Voltmeter}[V]}{1k\ [\Omega]}$$

Figure B (DEN-AN)

$$\text{Leakage Current Value } [A] = \frac{\text{Effective Value of Voltmeter}[V]}{500\ [\Omega]}$$

Figure B (IEC60950-1)

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