COSEL

TEST DATA OF MGS1R50515

Regulated DC Power Supply
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Object	

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⎯△⎯ Load 100%
---⊟--- Load 50%
—·—○—·— Load 0%

Input Current [A] vs Input Voltage [V]

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

2.Values

Input Voltage [V]	Input Current [A]		
	Load 0%	Load 50%	Load 100%
0.0	0.000	0.000	0.000
3.0	0.002	0.002	0.002
3.7	0.003	0.003	0.003
3.8	0.003	0.003	0.003
3.9	0.031	0.245	0.464
4.0	0.030	0.233	0.450
4.2	0.029	0.227	0.427
4.5	0.028	0.212	0.398
5.0	0.026	0.192	0.358
6.0	0.024	0.161	0.298
7.0	0.019	0.140	0.257
8.0	0.017	0.126	0.227
9.0	0.015	0.115	0.206
10.0	0.014	0.107	0.188
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MGS1R50515
Item	Input Current (by Load Current)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

——△—— Input Volt.   4.5V
– – –☐– – – Input Volt.   5V
—·—○—·— Input Volt.   9V

Input Current [A] vs Load Current [A]

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

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.00	0.028	0.026	0.015
0.02	0.099	0.090	0.061
0.04	0.171	0.155	0.096
0.06	0.246	0.222	0.132
0.08	0.322	0.290	0.168
0.10	0.398	0.358	0.206
0.11	0.441	0.396	0.224
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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COSEL

Model	MGS1R50515
Item	Input Power (by Load Current)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

—△— Input Volt. 4.5V
---□--- Input Volt. 5V
—·—○—·· Input Volt. 9V

Input Power [W] vs Load Current [A]

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

2.Values

Load Current [A]	Input Power [W]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.00	0.13	0.13	0.14
0.02	0.45	0.46	0.56
0.04	0.78	0.79	0.87
0.06	1.12	1.12	1.19
0.08	1.46	1.46	1.53
0.10	1.81	1.81	1.86
0.11	1.99	1.98	2.02
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MGS1R50515
Item	Efficiency (by Input Voltage)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

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

Efficiency [%] vs Input Voltage [V]

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

2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
4.4	80.4	84.4
4.5	80.3	84.4
4.8	80.2	84.4
5.0	80.1	84.3
7.0	77.1	83.8
9.0	73.4	81.9
10.0	70.6	80.9
--	-	-
--	-	-

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Model	MGS1R50515
Item	Efficiency (by Load Current)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

——△—— Input Volt.   4.5V
- - -□- - - Input Volt.   5V
—·—○—·— Input Volt.   9V

Load Current [A]

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

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.00	-	-	-
0.02	66.9	67.0	54.5
0.04	77.8	77.2	69.6
0.06	81.4	81.1	76.4
0.08	82.9	83.5	79.4
0.10	84.1	84.4	81.9
0.11	84.2	84.5	82.4
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MGS1R50515
Item	Line Regulation
Object	+15V0.1A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

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

Output Voltage [V] vs Input Voltage [V]

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

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
4.4	15.042	15.040
4.5	15.042	15.040
4.8	15.042	15.040
5.0	15.042	15.040
7.0	15.042	15.040
9.0	15.042	15.039
10.0	15.042	15.039
--	-	-
--	-	-

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Model	MGS1R50515
Item	Load Regulation
Object	+15V0.1A

Temperature　25°C
Testing Circuitry　Figure A

1.Graph

— △ — Input Volt.　4.5V
- - - ⊟ - - - Input Volt.　5V
— · — ○ — · — Input Volt.　9V

Output Voltage [V] vs Load Current [A]

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

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.00	15.048	15.048	15.049
0.02	15.046	15.046	15.045
0.04	15.044	15.044	15.043
0.06	15.043	15.043	15.042
0.08	15.041	15.041	15.040
0.10	15.040	15.040	15.039
0.11	15.039	15.039	15.038
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MGS1R50515		
Item	Dynamic Load Response	Temperature	25°C
		Testing Circuitry	Figure A
Object	+15V0.1A		

Input Volt.   5 V
Cycle   1000 ms
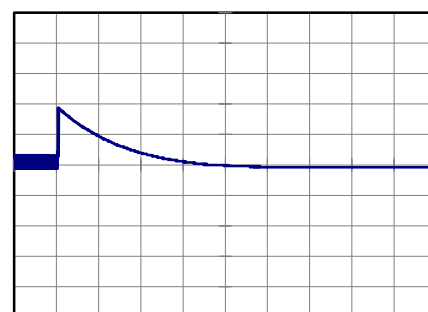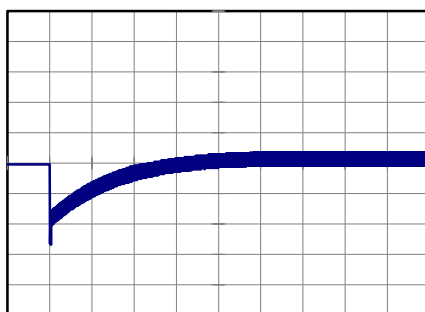
t1,t2 = 50 μs

Load Current

t1   t2

Min.Load (0A)←→
   Load 100% (0.1A)

100 mV/div

4 ms/div   4 ms/div
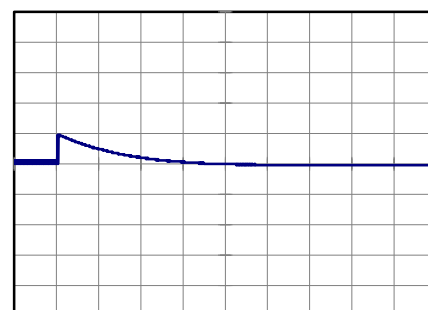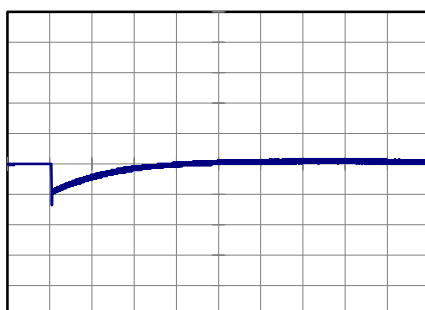
Min.Load (0A)←→
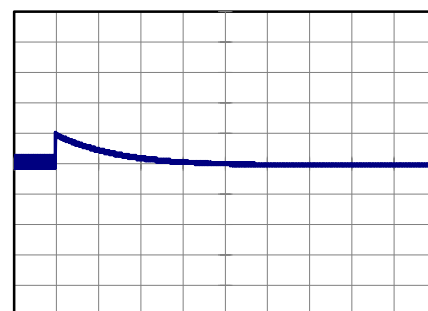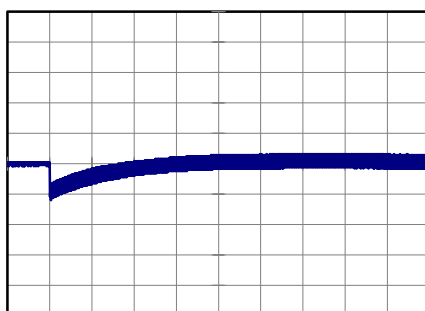   Load 50% (0.05A)

100 mV/div

4 ms/div   4 ms/div

Load 50% (0.05A)←→
   Load 100% (0.1A)

100 mV/div
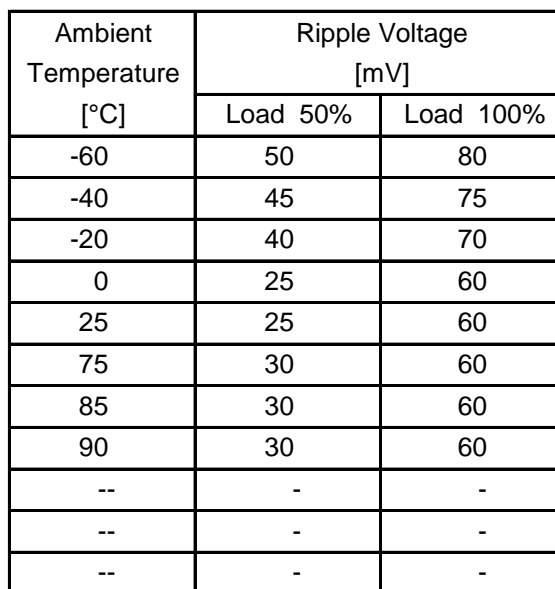
4 ms/div   4 ms/div

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Model	MGS1R50515
Item	Ripple Voltage (by Load Current)
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure B

1.Graph

—△— Input Volt. 4.5V
—·—○—·— Input Volt. 9V

Load Current [A]

Measured by 100 MHz Oscilloscope.
Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated
load current.

Ripple [mVp-p]

Fig.Complex Ripple Wave Form

2.Values

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 4.5 [V]	Input Volt. 9 [V]
0.00	5	20
0.02	15	20
0.04	20	20
0.06	40	30
0.08	50	35
0.10	65	50
0.11	75	55
--	-	-
--	-	-
--	-	-
--	-	-

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Model	MGS1R50515
Item	Ripple-Noise
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure B

1.Graph

— △ — Input Volt. 4.5V
— ·—⊖—·— Input Volt. 9V

Ripple Voltage [mV] vs Load Current [A]

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 4.5 [V]	Input Volt. 9 [V]
0.00	10	25
0.02	20	25
0.04	25	25
0.06	45	35
0.08	55	40
0.10	70	55
0.11	80	60
--	-	-
--	-	-
--	-	-
--	-	-

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.

Ripple Noise[mVp-p]

Fig.Complex Ripple Noise Wave Form

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Model	MGS1R50515		
Item	Ripple Voltage (by Ambient Temp.)	Testing Circuitry	Figure B
Object	+15V0.1A		

1.Graph

2.Values

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

Ripple Voltage [mV]

Ambient Temperature [°C]

Input Volt. 5V

Measured by 100 MHz Oscilloscope.
Note: Slanted line shows the range of the rated
ambient temperature.

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	50	80
-40	45	75
-20	40	70
0	25	60
25	25	60
75	30	60
85	30	60
90	30	60
--	-	-
--	-	-
--	-	-

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COSEL

Model	MGS1R50515
Item	Ambient Temperature Drift
Object	+15V0.1A

Testing Circuitry   Figure A

1.Graph

———△——— Input Volt.   4.5V
- - -☐- - - Input Volt.   5V
—·—○—·— Input Volt.   9V

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. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
-60	14.920	14.921	14.921
-40	14.948	14.949	14.948
-20	14.983	14.984	14.983
0	15.010	15.010	15.010
25	15.040	15.040	15.039
75	15.054	15.054	15.054
85	15.056	15.056	15.056
90	15.057	15.057	15.057
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MGS1R50515	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+15V0.1A	

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 - 85°C

Input Voltage : 4.5 - 9V
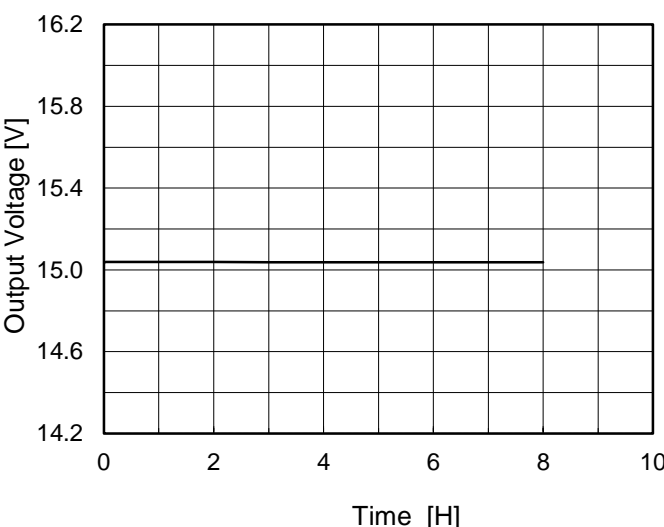
Load Current   : 0 - 0.1A

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

* Output Voltage Accuracy (Ratio) = $\dfrac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}}$ × 100

2.Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	85	9	0	15.068	±60	±0.4
Minimum Voltage	-40	4.5	0.1	14.948		

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Model	MGS1R50515
Item	Time Lapse Drift
Object	+15V0.1A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

Input Volt. 5V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	15.036
0.5	15.039
1.0	15.038
2.0	15.038
3.0	15.038
4.0	15.038
5.0	15.038
6.0	15.037
7.0	15.037
8.0	15.037

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COSEL

Model	MGS1R50515	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+15V0.1A	

1.Graph

Input Volt. 5 V

Load 50%

Output Volt.

[2V/div]

0

Load 100%

Output Volt.

[2V/div]

0

Input Volt.

0

[1V/div] Time [5ms/div] Time [5ms/div]
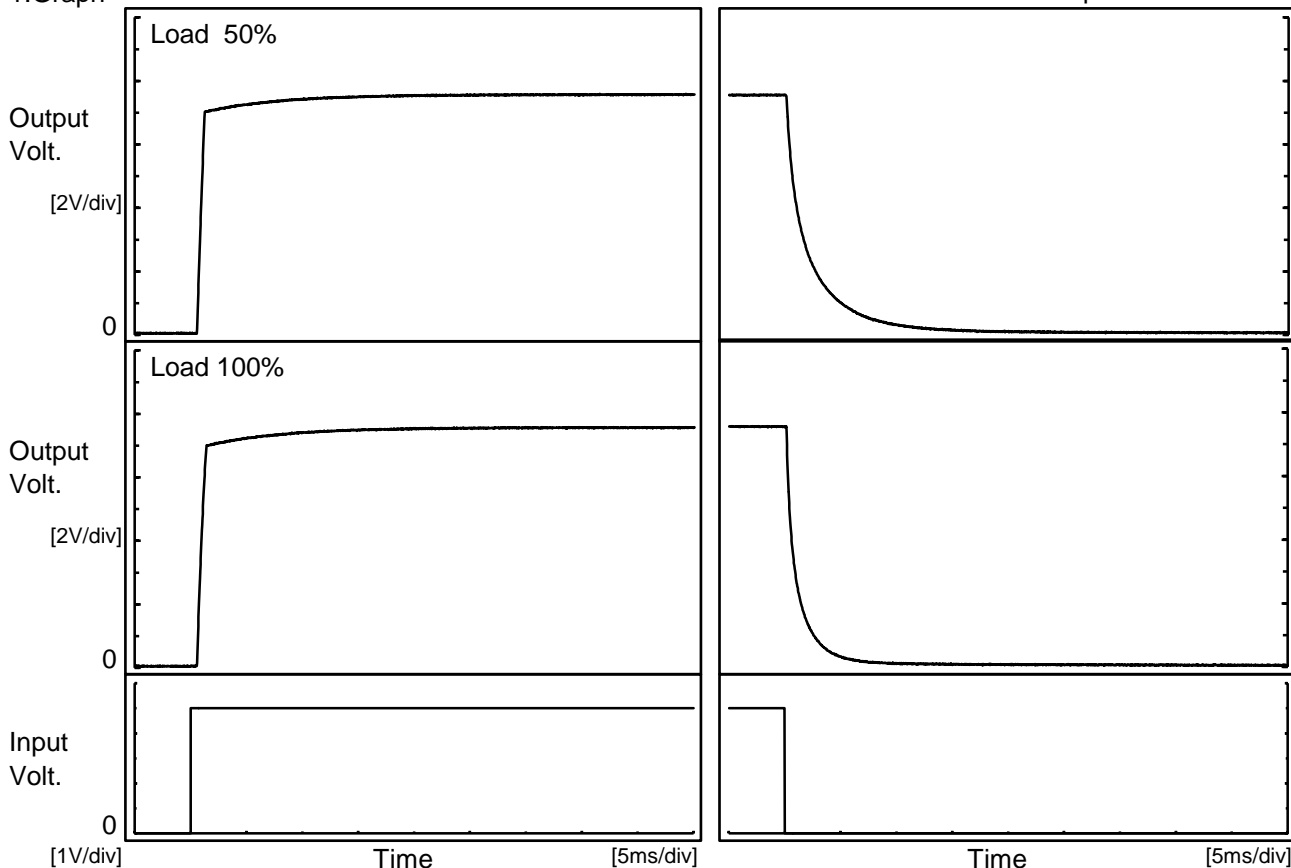
2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	0.7	0.6	1.3	0.3	5.8
100 %	0.7	0.7	1.4	0.2	2.8

Output Volt.

90%

10%

Input Volt.

Td Tr Th Tf

Ts

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COSEL

Model	MGS1R50515
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+15V0.1A

Testing Circuitry   Figure A

1.Graph

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

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

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

2.Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-60	3.7	3.7
-40	3.6	3.7
-20	3.6	3.6
0	3.6	3.6
25	3.6	3.6
75	3.5	3.6
85	3.5	3.6
90	3.5	3.6
--	-	-
--	-	-
--	-	-

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COSEL

Model	MGS1R50515
Item	Overcurrent Protection
Object	+15V0.1A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

—————— Input Volt.   4.5V
—————— Input Volt.   5V
—————— Input Volt.   9V

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. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
15.0	0.10	0.10	0.10
14.3	0.14	0.14	0.14
13.5	0.14	0.14	0.14
12.0	0.15	0.15	0.15
10.5	0.16	0.16	0.16
9.0	0.17	0.17	0.17
7.5	0.18	0.18	0.18
6.0	0.20	0.19	0.19
4.5	0.21	0.21	0.20
3.0	0.23	0.22	0.21
1.5	0.25	0.24	0.22
0.0	0.24	0.23	0.20

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COSEL

Model	MGS1R50515
Item	Switching Frequency (by Load Current)
Object	+15V0.1A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

———△——— Input Volt. 4.5V
– – –⊟– – – Input Volt. 5V
—·—○—·— Input Volt. 9V

Switching Frequency [kHz] vs Load Current [A]

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

      When load current is low, MG operates
      intermittently, so switching frequency
      would not become constant.

2.Values

Load Current [A]	Frequency [kHz]		
	Input Volt. 4.5[V]	Input Volt. 5[V]	Input Volt. 9[V]
0.00	980	1000	1150
0.02	658	689	830
0.04	491	522	670
0.06	389	420	560
0.08	329	353	482
0.10	279	303	422
0.11	261	288	410
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Electronic Switch → Power Meter → Temperature Chamber [Power Supply] → Electronic DC Load → Oscilloscope

DC Power Supply → Electronic Switch

Relay Unit

DVM

Data Acquisition/Control Unit

Figure A

Measuring board

C1=1µF(Ceramic Capacitor)

Input pin   Output pin

+Vin   +Vout

Power Supply

C1

Electric DC Load

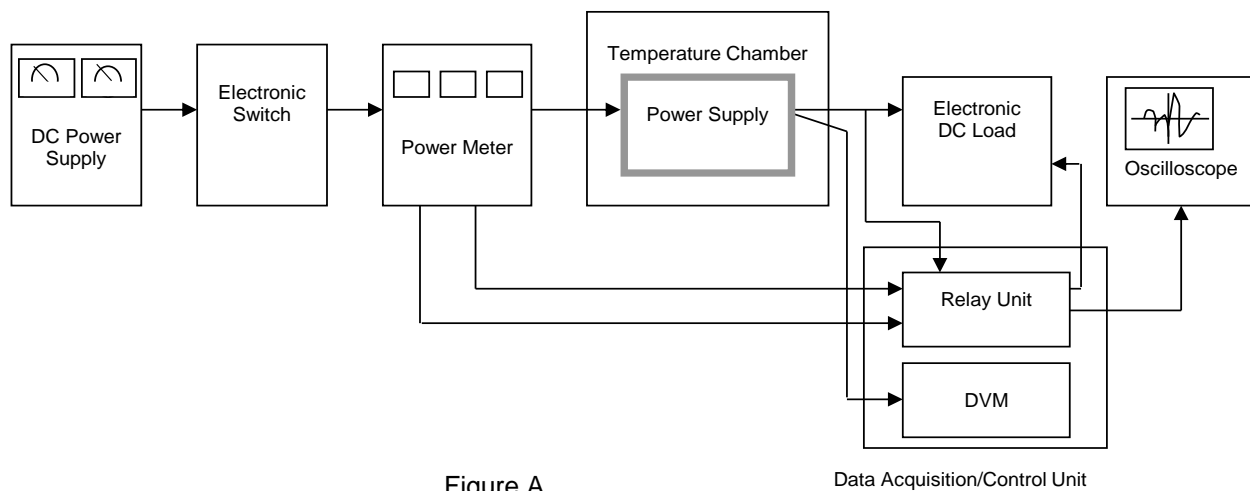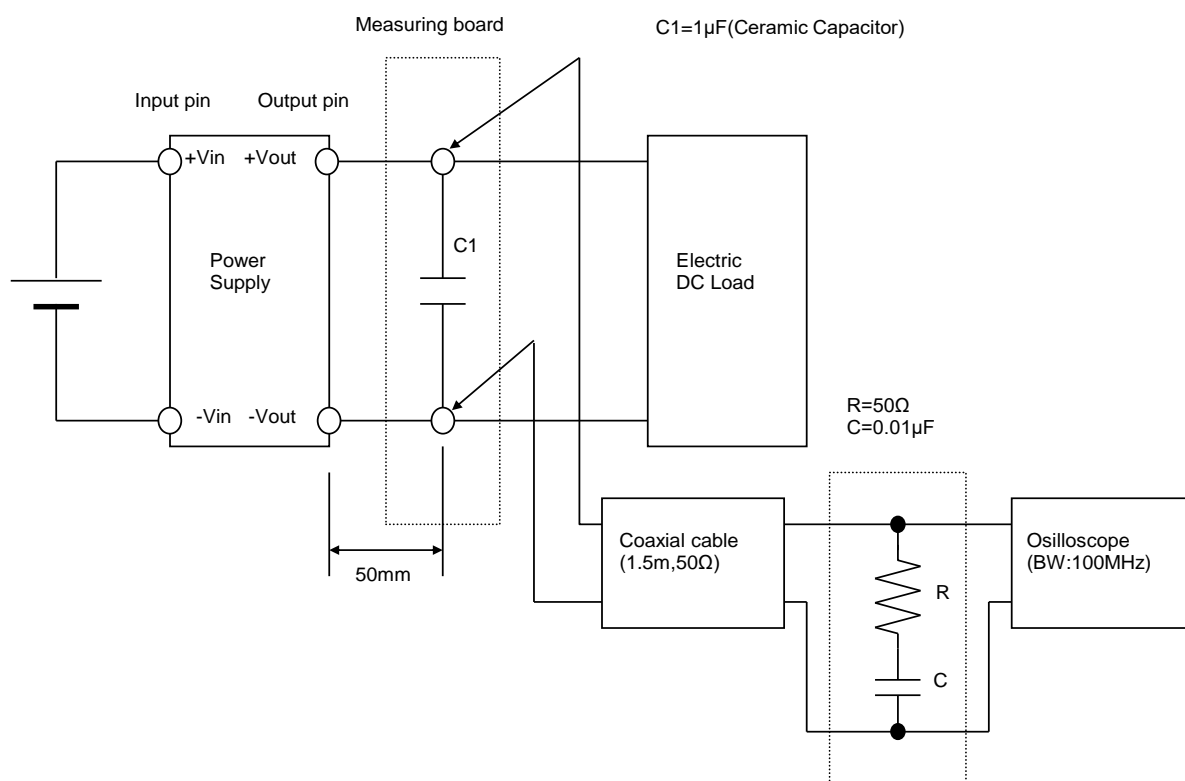-Vin   -Vout

50mm

Coaxial cable (1.5m,50Ω)

R=50Ω
C=0.01µF

R

C

Osilloscope (BW:100MHz)

Figure B（Ripple and Ripple noise Characteristic）

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