TEST DATA OF MGFS1R5243R3

Regulated DC Power Supply
December 29, 2016

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COSEL CO.,LTD.

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Model	MGFS1R5243R3
Item	Input Current (by Input Voltage)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

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

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
6.0	0.003	0.003	0.003
8.0	0.003	0.003	0.004
8.2	0.003	0.003	0.003
8.4	0.011	0.106	0.206
8.6	0.011	0.103	0.201
8.8	0.011	0.100	0.196
9.0	0.011	0.100	0.192
12.0	0.009	0.075	0.142
18.0	0.007	0.051	0.094
24.0	0.006	0.039	0.072
30.0	0.004	0.032	0.058
36.0	0.003	0.027	0.050
40.0	0.004	0.025	0.046
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MGFS1R5243R3
Item	Input Current (by Load Current)
Object	
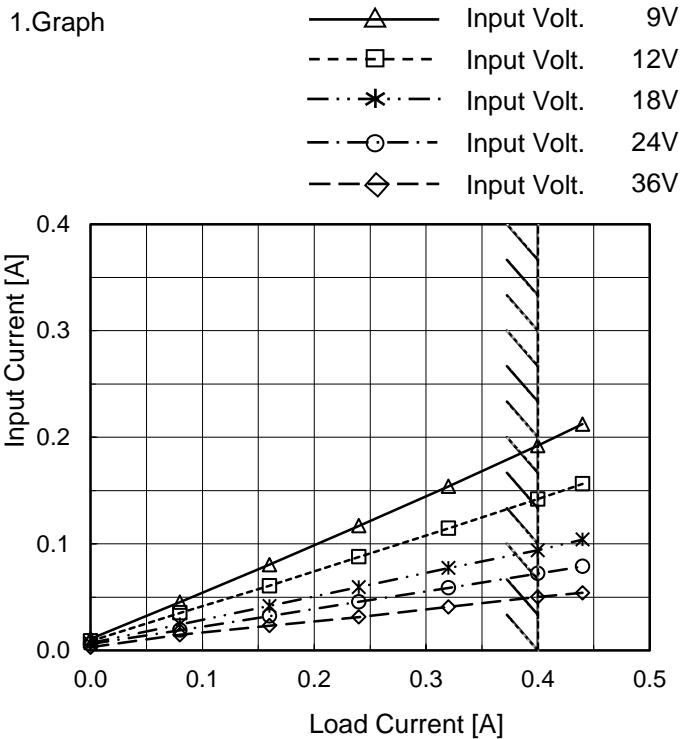
Temperature　　25°C
Testing Circuitry　Figure A

1.Graph

	Input Volt.	9V
	Input Volt.	12V
	Input Volt.	18V
	Input Volt.	24V
	Input Volt.	36V

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

2.Values

Load Current [A]	Input Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	0.011	0.009	0.007	0.006	0.003
0.08	0.045	0.035	0.024	0.019	0.015
0.16	0.081	0.061	0.042	0.032	0.023
0.24	0.117	0.088	0.059	0.046	0.031
0.32	0.154	0.115	0.077	0.059	0.041
0.40	0.192	0.142	0.094	0.072	0.050
0.44	0.212	0.156	0.104	0.079	0.054
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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Model	MGFS1R5243R3
Item	Input Power (by Load Current)
Object	
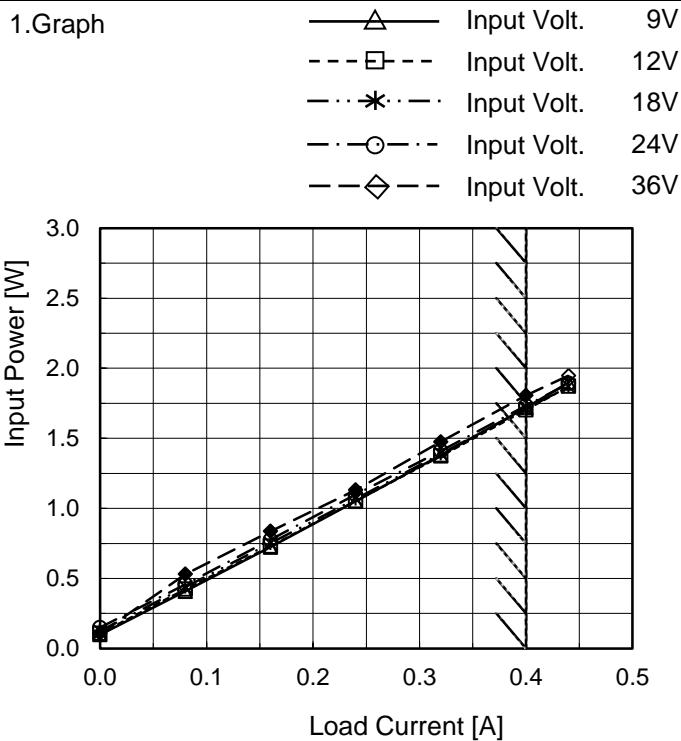
Temperature   25°C
Testing Circuitry   Figure A

1.Graph

————△———— Input Volt.   9V
– – –☐– – – Input Volt.   12V
—··—✳··—· Input Volt.   18V
—·—○—··— Input Volt.   24V
— —◇— — Input Volt.   36V

2.Values

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

Load Current	Input Power [W]				
	Input Volt.	Input Volt.	Input Volt.	Input Volt.	Input Volt.
[A]	9[V]	12[V]	18[V]	24[V]	36[V]
0.00	0.10	0.11	0.12	0.15	0.11
0.08	0.41	0.42	0.44	0.46	0.53
0.16	0.72	0.73	0.75	0.78	0.84
0.24	1.05	1.05	1.07	1.10	1.13
0.32	1.38	1.37	1.39	1.41	1.48
0.40	1.72	1.70	1.71	1.73	1.81
0.44	1.90	1.87	1.87	1.89	1.95
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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Model	MGFS1R5243R3
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%
8.6	75.9	77.3
9.0	75.4	77.6
12.0	74.7	78.4
15.0	74.1	78.3
18.0	73.8	78.3
24.0	71.9	77.2
30.0	70.2	76.0
36.0	66.5	74.3
40.0	64.3	72.0

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Model	MGFS1R5243R3
Item	Efficiency (by Load Current)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph

———△——— Input Volt. 9V
- - -☐- - - Input Volt. 12V
—··✳··— Input Volt. 18V
—·—○—·— Input Volt. 24V
— —◇— — Input Volt. 36V
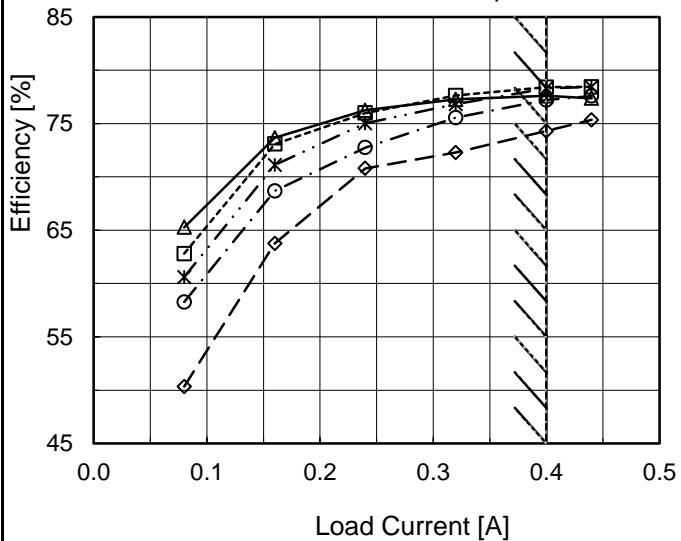
Load Current [A]

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

2.Values

Load Current	Efficiency [%]				
	Input Volt.	Input Volt.	Input Volt.	Input Volt.	Input Volt.
[A]	9[V]	12[V]	18[V]	24[V]	36[V]
0.00	-	-	-	-	-
0.08	65.3	62.8	60.6	58.3	50.3
0.16	73.7	73.1	71.1	68.7	63.7
0.24	76.2	76.0	75.0	72.7	70.8
0.32	77.3	77.6	76.8	75.6	72.3
0.40	77.6	78.4	78.3	77.2	74.3
0.44	77.4	78.4	78.4	77.6	75.3
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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Model	MGFS1R5243R3
Item	Line Regulation
Object	+3.3V0.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

- - -□- - - Load 50%
———△——— Load 100%

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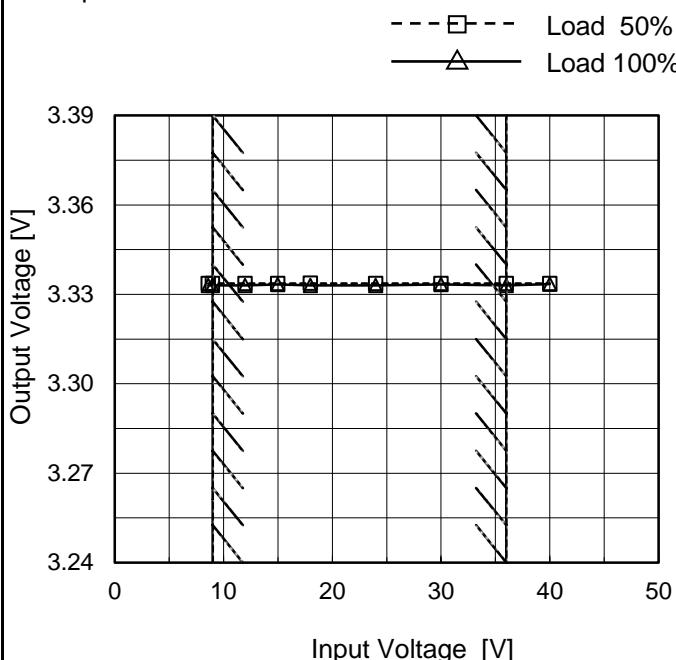
2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
8.6	3.334	3.333
9.0	3.334	3.333
12.0	3.334	3.333
15.0	3.334	3.333
18.0	3.334	3.333
24.0	3.334	3.333
30.0	3.334	3.333
36.0	3.334	3.333
40.0	3.334	3.333

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COSEL

Model	MGFS1R5243R3
Item	Load Regulation
Object	+3.3V0.4A
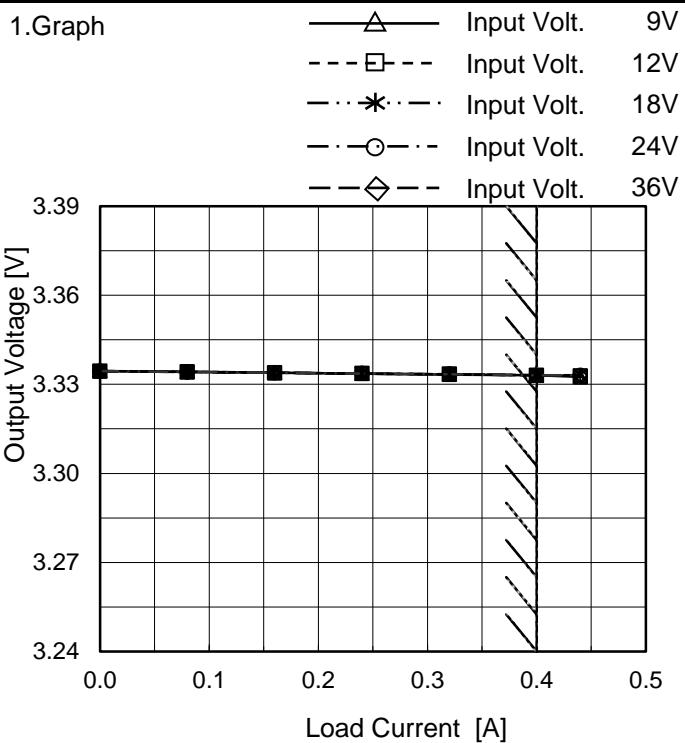
Temperature   25°C
Testing Circuitry   Figure A

1.Graph

		Input Volt.	9V
—△—		Input Volt.	9V
---⊟---		Input Volt.	12V
—··✳··—		Input Volt.	18V
—·—○—·—		Input Volt.	24V
——◇——		Input Volt.	36V

2.Values

Load Current [A]	Output Voltage [V]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	3.335	3.334	3.334	3.334	3.335
0.08	3.334	3.334	3.334	3.334	3.334
0.16	3.334	3.334	3.334	3.334	3.334
0.24	3.334	3.334	3.334	3.334	3.334
0.32	3.333	3.333	3.333	3.333	3.333
0.40	3.333	3.333	3.333	3.333	3.333
0.44	3.333	3.333	3.333	3.333	3.333
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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

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Model	MGFS1R5243R3		
Item	Dynamic Load Response	Temperature	25°C
		Testing Circuitry	Figure A
Object	+3.3V0.4A		

Input Volt. 24 V

Cycle 100 ms

t1,t2 = 100 μ s

Load Current

t1 t2

Min.Load (0A)←→
Load 100% (0.4A)

100 mV/div

400 µs/div

400 µs/div

Min.Load (0A)←→
Load 50% (0.2A)

100 mV/div

400 µs/div

400 µs/div

Load 50% (0.2A)←→
Load 100% (0.4A)

100 mV/div

400 µs/div

400 µs/div

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Model	MGFS1R5243R3
Item	Ripple Voltage (by Load Current)
Object	+3.3V0.4A

Temperature   25°C
Testing Circuitry   Figure B

1.Graph

――△―― Input Volt.   9V
―・―○―・― Input Volt.   36V

Ripple Voltage [mV] vs 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. 9 [V]	Input Volt. 36 [V]
0.00	5	10
0.08	15	10
0.16	20	10
0.24	30	10
0.32	50	15
0.40	70	25
0.44	85	40
--	-	-
--	-	-
--	-	-
--	-	-

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Model	MGFS1R5243R3
Item	Ripple-Noise
Object	+3.3V0.4A

Temperature   25°C
Testing Circuitry   Figure B

1.Graph

———△——— Input Volt.   9V
—·—○—·— Input Volt.   36V

Ripple Voltage [mV] vs Load Current [A]

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 9 [V]	Input Volt. 36 [V]
0.00	5	10
0.08	15	15
0.16	25	15
0.24	35	15
0.32	55	15
0.40	75	30
0.44	95	50
--	-	-
--	-	-
--	-	-
--	-	-

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	MGFS1R5243R3		
Item	Ripple Voltage (by Ambient Temp.)	Testing Circuitry	Figure B
Object	+3.3V0.4A		

1.Graph

2.Values

Ambient Temperature [°C]

Input Volt.   24V
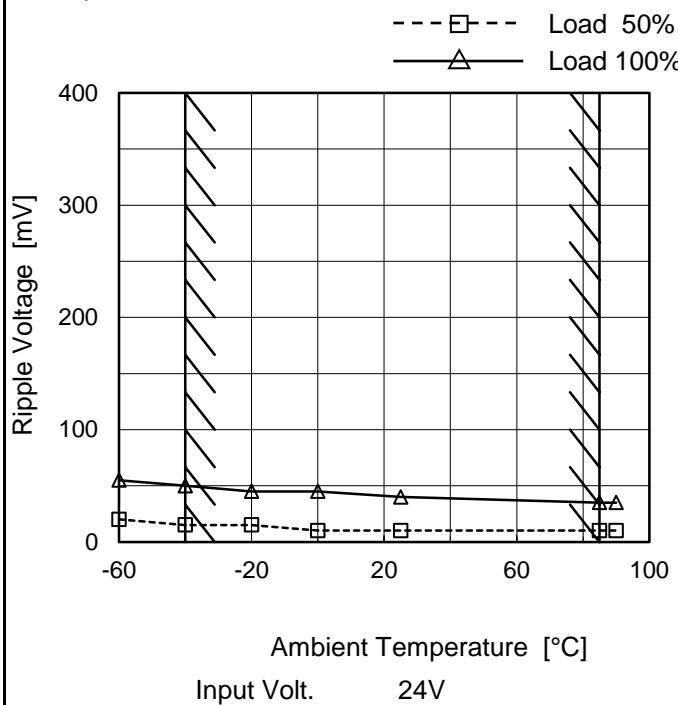
Measured by 100 MHz Oscilloscope.
Note: Slanted line shows the range of the rated
        ambient temperature.

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	20	55
-40	15	50
-20	15	45
0	10	45
25	10	40
85	10	35
90	10	35
--	-	-
--	-	-
--	-	-
--	-	-

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Model	MGFS1R5243R3
Item	Ambient Temperature Drift
Object	+3.3V0.4A
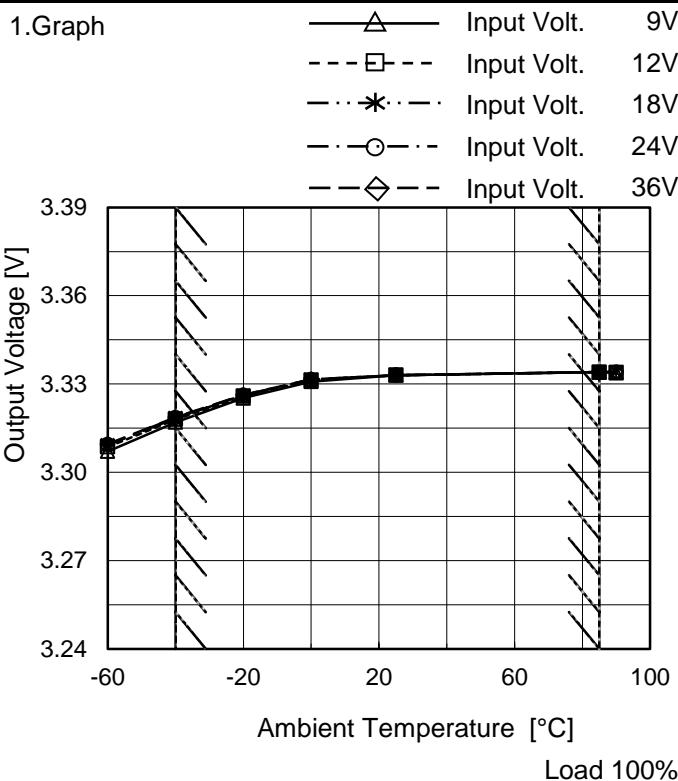
Testing Circuitry   Figure A

1.Graph

—△—	Input Volt.	9V
- - -⊟- - -	Input Volt.	12V
—··✳··—·	Input Volt.	18V
—·—○—·—	Input Volt.	24V
— —◇— —	Input Volt.	36V

Ambient Temperature [°C]

Load 100%

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

2.Values

Ambient	Output Voltage [V]				
Temperature	Input Volt.	Input Volt.	Input Volt.	Input Volt.	Input Volt.
[°C]	9[V]	12[V]	18[V]	24[V]	36[V]
-60	3.307	3.309	3.309	3.309	3.310
-40	3.317	3.318	3.318	3.319	3.319
-20	3.325	3.326	3.326	3.326	3.326
0	3.331	3.331	3.332	3.332	3.332
25	3.333	3.333	3.333	3.333	3.333
85	3.334	3.334	3.334	3.334	3.334
90	3.334	3.334	3.334	3.334	3.334
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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Model	MGFS1R5243R3		
Item	Output Voltage Accuracy	Testing Circuitry	Figure A
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 - 85°C

Input Voltage : 9 - 36V

Load Current : 0 - 0.4A

* 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	75	36	0	3.338	±11	±0.3
Minimum Voltage	-40	9	0.4	3.317		

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COSEL

Model	MGFS1R5243R3
Item	Time Lapse Drift
Object	+3.3V0.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph
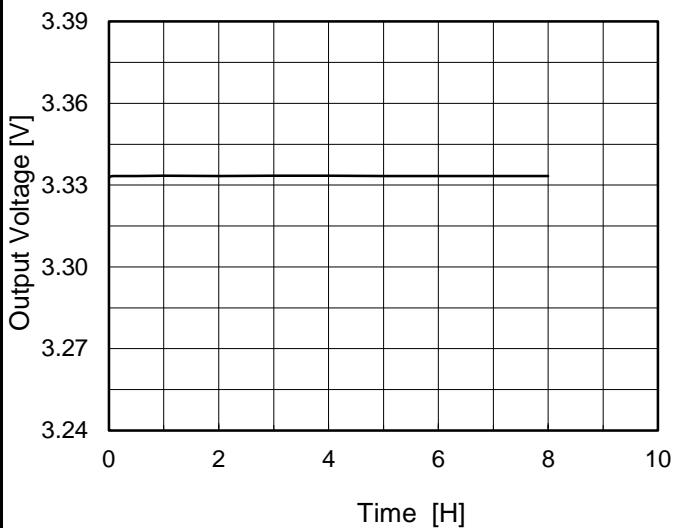
Input Volt. 24V
Load 100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	3.333
0.5	3.333
1.0	3.333
2.0	3.333
3.0	3.333
4.0	3.333
5.0	3.333
6.0	3.333
7.0	3.333
8.0	3.333

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Model	MGFS1R5243R3
Item	Rise and Fall Time
Object	+3.3V0.4A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

Input Volt. 24 V

Load 50%

Output Volt.

[0.5V/div]

0

Load 100%

Output Volt.

[0.5V/div]

0

Input Volt.

0

[10V/div]

Time

[5ms/div]

Time

[5ms/div]
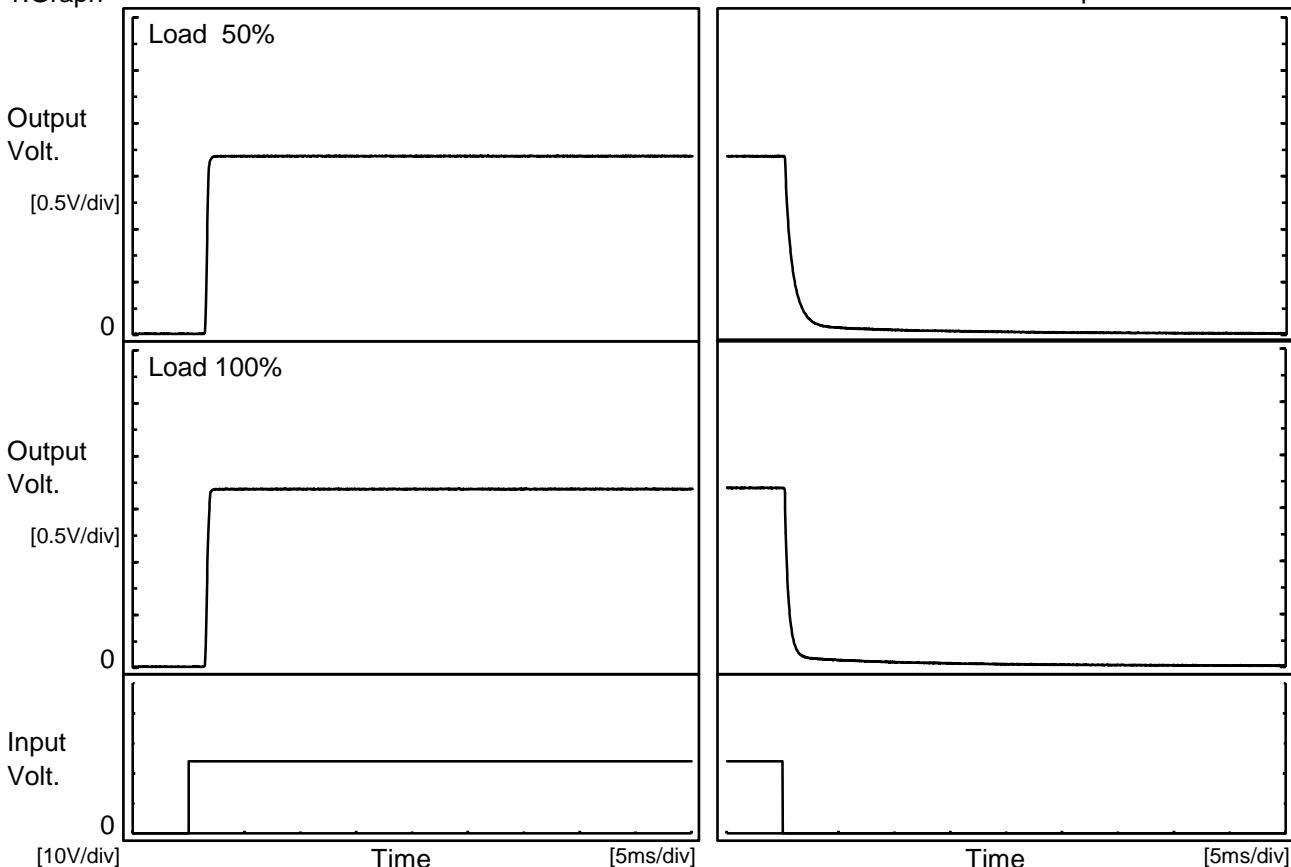
2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	1.5	0.3	1.8	0.3	1.9
100 %	1.5	0.3	1.8	0.2	0.9

Output Volt.

90%

10%

Input Volt.

Td Tr

Th Tf

Ts

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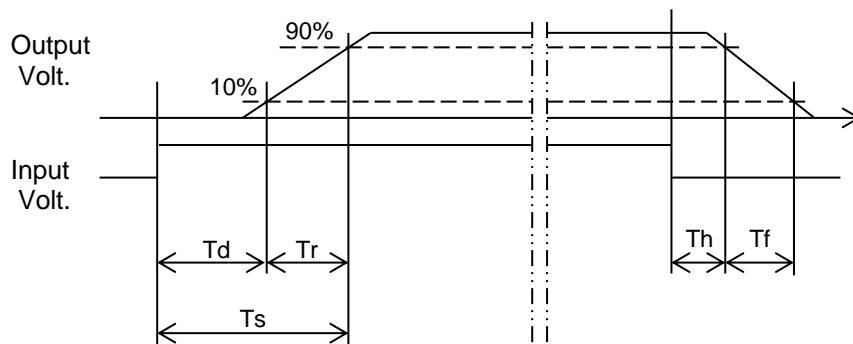
COSEL

Model	MGFS1R5243R3	
Item	Minimum Input Voltage for Regulated Output Voltage	Testing Circuitry Figure A
Object	+3.3V0.4A	
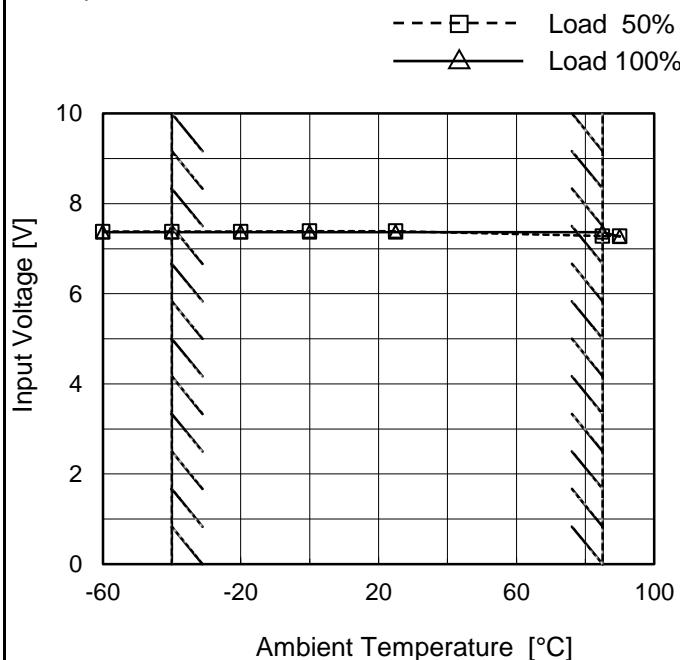
1.Graph

--- ⊡ --- 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	7.4	7.4
-40	7.4	7.4
-20	7.4	7.4
0	7.4	7.4
25	7.4	7.4
85	7.3	7.4
90	7.3	7.3
--	-	-
--	-	-
--	-	-
--	-	-

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Model	MGFS1R5243R3
Item	Overcurrent Protection
Object	+3.3V0.4A
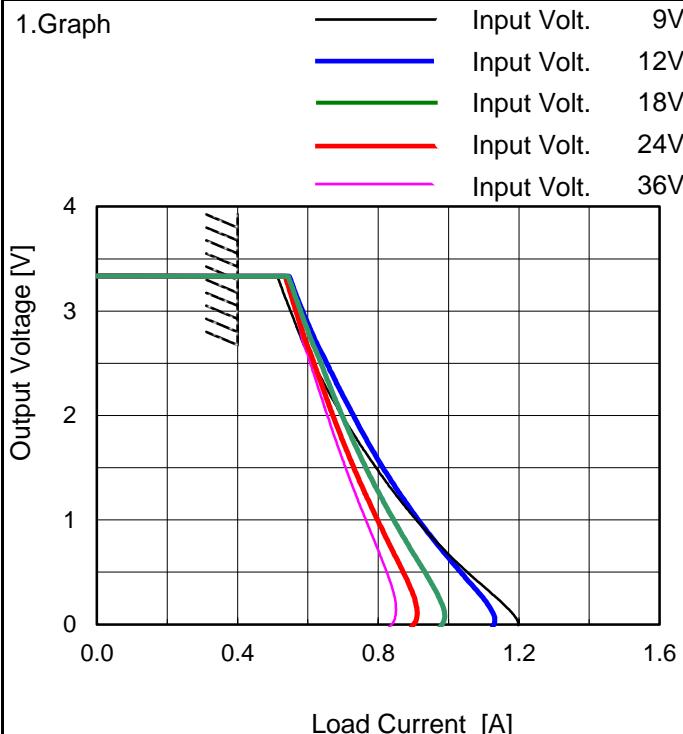
Temperature 25°C
Testing Circuitry Figure A

1.Graph

——	Input Volt. 9V
——	Input Volt. 12V
——	Input Volt. 18V
——	Input Volt. 24V
——	Input Volt. 36V

Load Current [A]

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

2.Values

Output Voltage [V]	Load Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
3.14	0.535	0.568	0.565	0.553	0.554
2.97	0.554	0.588	0.581	0.568	0.567
2.64	0.594	0.632	0.619	0.602	0.593
2.31	0.645	0.680	0.658	0.638	0.624
1.98	0.699	0.731	0.699	0.673	0.656
1.65	0.761	0.785	0.744	0.711	0.690
1.32	0.832	0.846	0.791	0.754	0.727
0.99	0.908	0.914	0.844	0.799	0.766
0.66	1.003	0.991	0.903	0.846	0.804
0.33	1.109	1.076	0.962	0.893	0.841
0.00	1.199	1.125	0.975	0.895	0.817
--	-	-	-	-	-

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Model	MGFS1R5243R3
Item	Switching frequency (by Load Current)
Object	+3.3V0.4A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

───△───	Input Volt. 9V
---⊟---	Input Volt. 12V
—··✳··—·	Input Volt. 18V
—·─○─··	Input Volt. 24V
——◇——	Input Volt. 36V
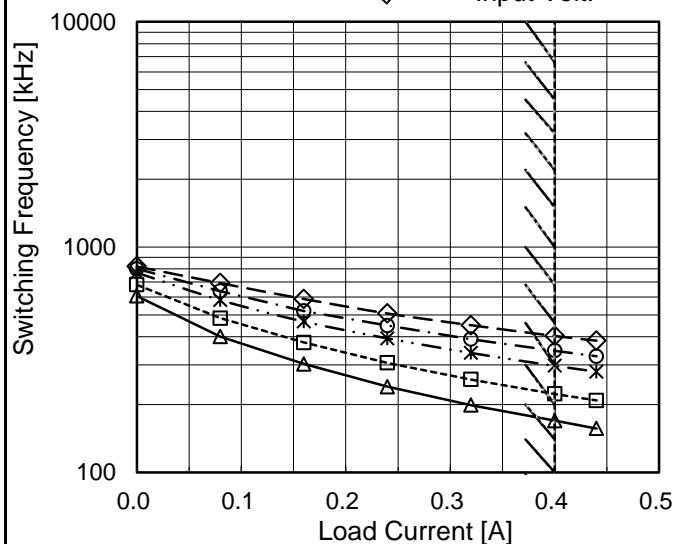
Note: Slanted line shows the range of the rated
       load current.

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

2.Values

| Load Current [A]	Input Current [A]				
	Input Volt. 9[V]	Input Volt. 12[V]	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.00	607	680	770	800	820
0.08	400	483	581	637	692
0.16	303	377	467	520	589
0.24	240	306	393	448	507
0.32	199	258	339	390	450
0.40	170	223	297	347	403
0.44	157	209	280	327	385
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-
--	-	-	-	-	-

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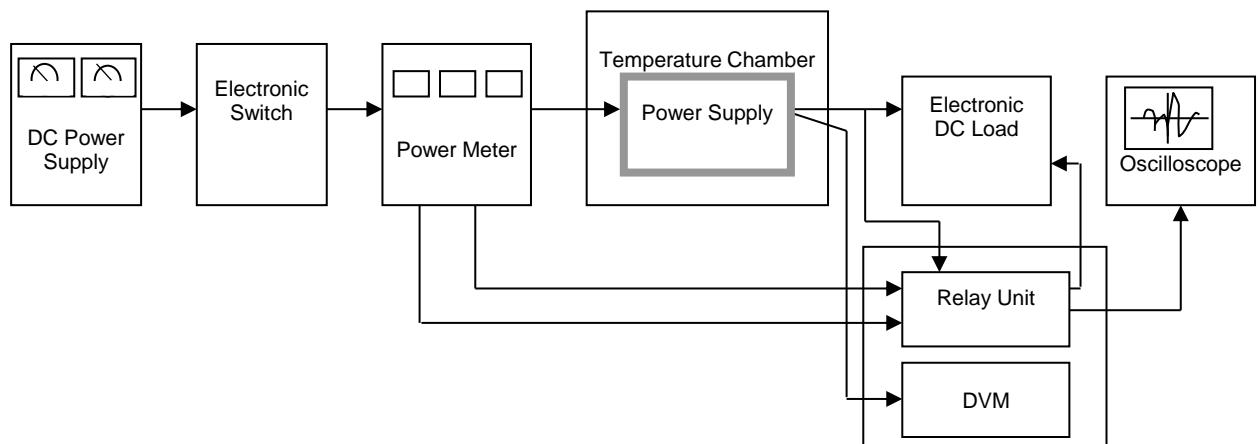
Figure A

Data Acquisition/Control Unit
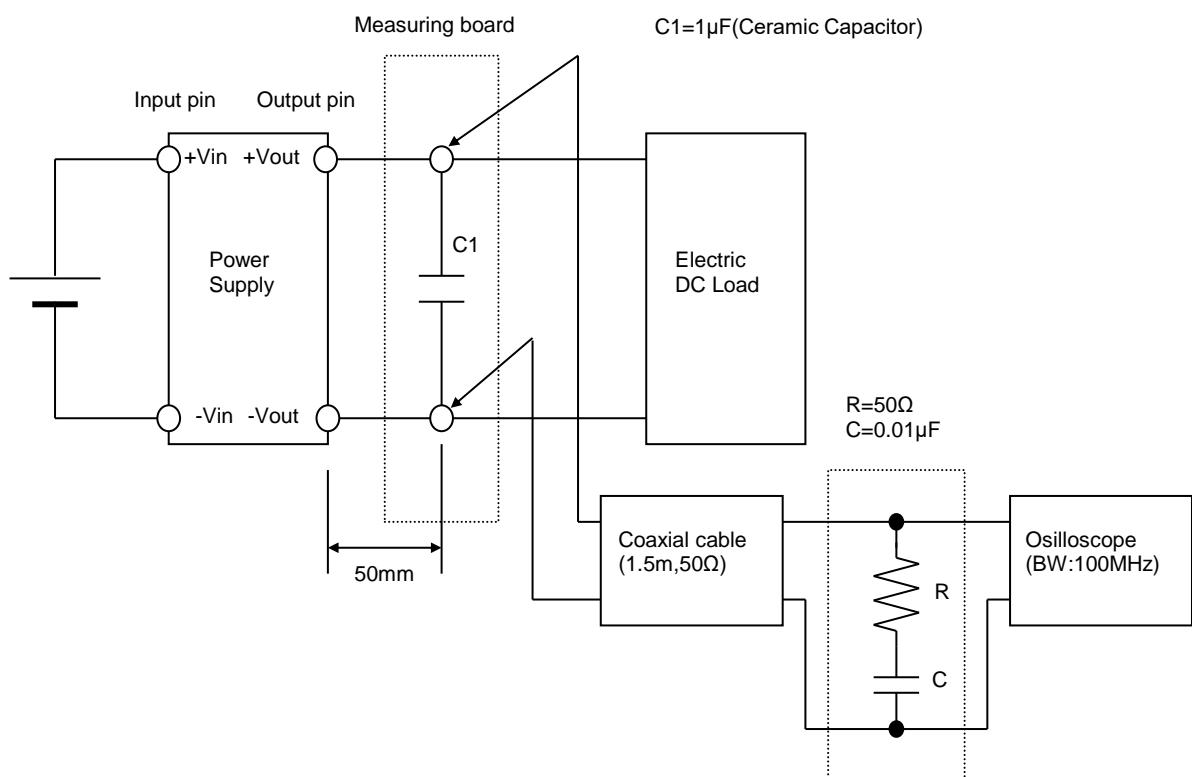
Figure B（Ripple and Ripple noise Characteristic）

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