COSEL

TEST DATA OF MGS1R52412

Regulated DC Power Supply
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COSEL CO.,LTD.

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Model	MGS1R52412
Item	Input Current (by Input Voltage)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

——△—— 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
16.0	0.004	0.004	0.004
16.8	0.008	0.060	0.111
17.0	0.008	0.058	0.109
17.2	0.008	0.057	0.108
17.4	0.008	0.057	0.106
17.6	0.008	0.056	0.105
18.0	0.008	0.055	0.103
22.0	0.007	0.046	0.085
24.0	0.006	0.042	0.078
28.0	0.006	0.037	0.067
32.0	0.006	0.032	0.059
36.0	0.005	0.029	0.053
40.0	0.005	0.027	0.048
--	-	-	-
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--	-	-	-

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Model	MGS1R52412
Item	Input Current (by Load Current)
Object	

Temperature   25°C
Testing Circuitry   Figure A

1.Graph
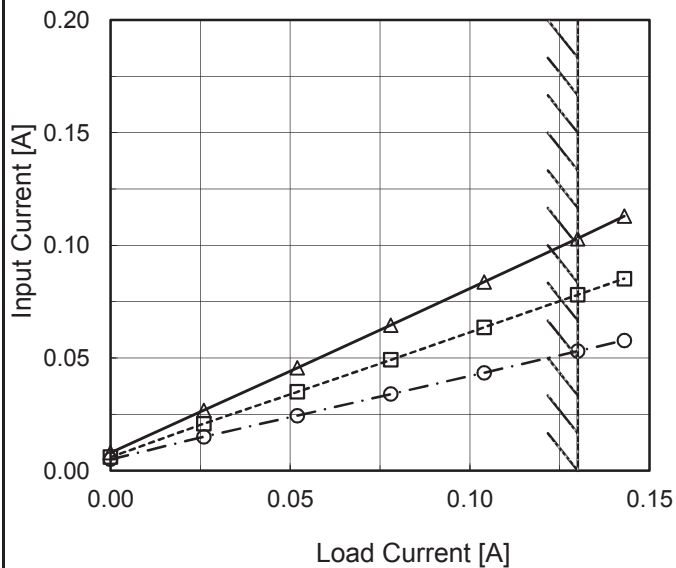
△ — Input Volt.   18V
□ --- Input Volt.   24V
○ —·— Input Volt.   36V

Input Current [A] vs Load Current [A]

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	0.008	0.006	0.005
0.026	0.027	0.021	0.015
0.052	0.046	0.035	0.024
0.078	0.065	0.049	0.034
0.104	0.084	0.064	0.043
0.130	0.103	0.078	0.053
0.143	0.113	0.085	0.058
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--	-	-	-
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Note: Slanted line shows the range of the rated
load current.

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Model	MGS1R52412
Item	Input Power (by Load Current)
Object	————

Temperature 25°C
Testing Circuitry Figure A

1.Graph
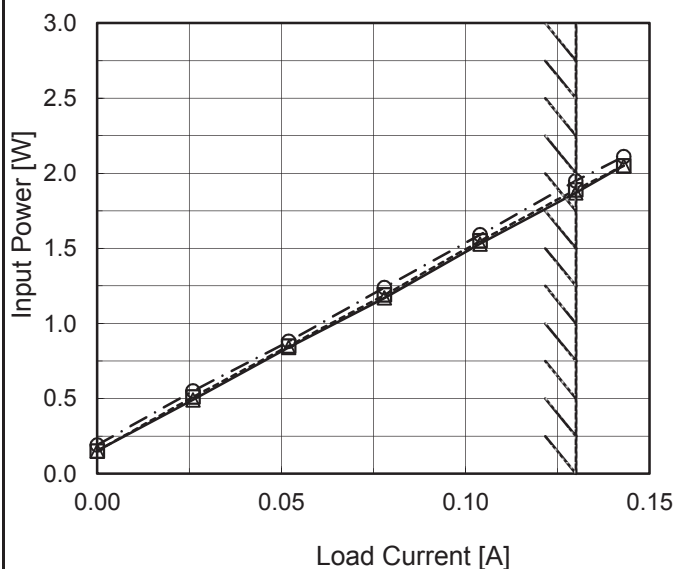
——△—— Input Volt. 18V
- - -☐- - - Input Volt. 24V
— · —○— · — Input Volt. 36V

2.Values

Load Current [A]	Input Power [W]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	0.15	0.15	0.19
0.026	0.49	0.51	0.55
0.052	0.84	0.85	0.88
0.078	1.17	1.19	1.24
0.104	1.53	1.55	1.59
0.130	1.87	1.89	1.95
0.143	2.05	2.05	2.11
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

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Model	MGS1R52412
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.
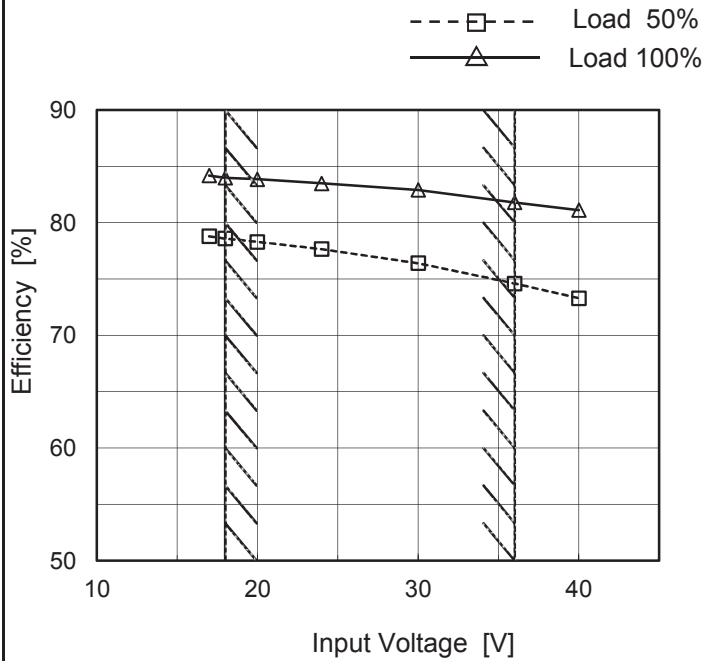
2.Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
17	78.8	84.2
18	78.6	84.0
20	78.3	83.9
24	77.6	83.5
30	76.4	82.9
36	74.6	81.8
40	73.3	81.1
--	-	-
--	-	-

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Model	MGS1R52412
Item	Efficiency (by Load Current)
Object	

Temperature 25°C
Testing Circuitry Figure A

1.Graph
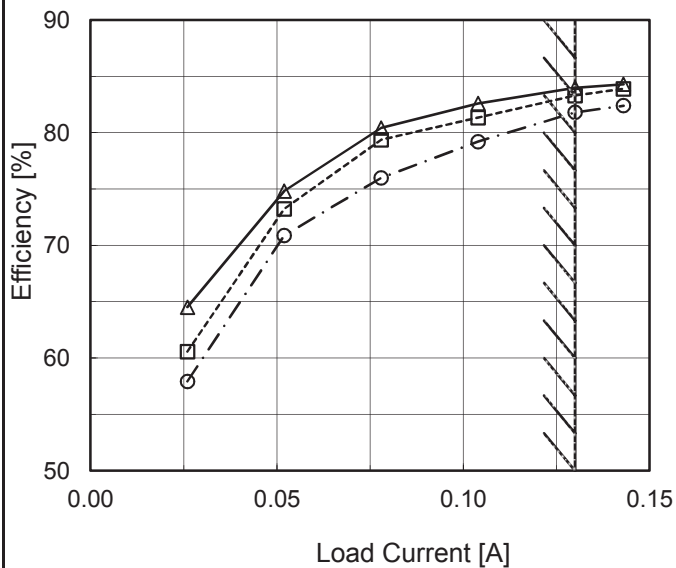
 ——△—— Input Volt. 18V
 ----□---- Input Volt. 24V
 —·—○—·— Input Volt. 36V

Efficiency [%] vs Load Current [A]

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	-	-	-
0.026	64.5	60.6	57.9
0.052	74.8	73.2	70.9
0.078	80.4	79.4	76.0
0.104	82.6	81.3	79.2
0.130	84.0	83.3	81.8
0.143	84.3	83.9	82.4
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

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Model	MGS1R52412
Item	Line Regulation
Object	+12V0.13A

Temperature 25°C
Testing Circuitry Figure A

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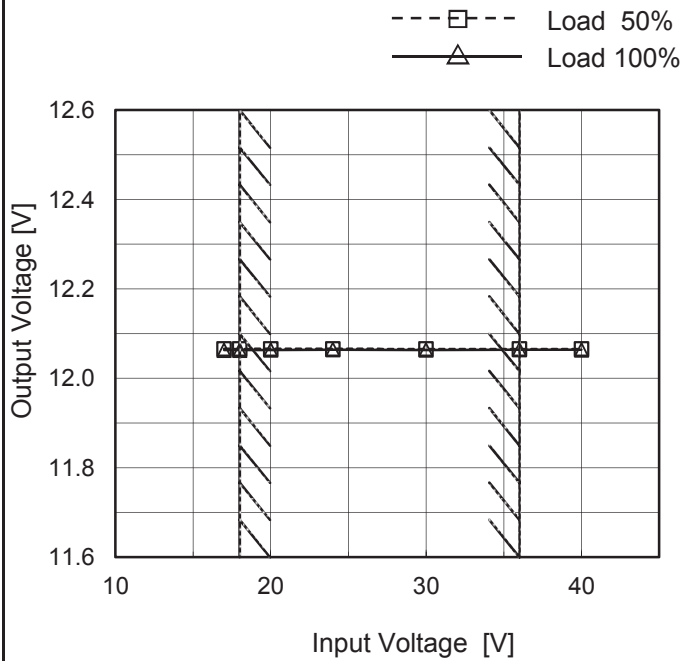
Note: Slanted line shows the range of the rated input voltage.

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
17	12.066	12.063
18	12.066	12.063
20	12.066	12.063
24	12.066	12.064
30	12.066	12.063
36	12.066	12.064
40	12.066	12.064
--	-	-
--	-	-

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Model	MGS1R52412
Item	Load Regulation
Object	+12V0.13A

Temperature 25°C
Testing Circuitry Figure A

1.Graph
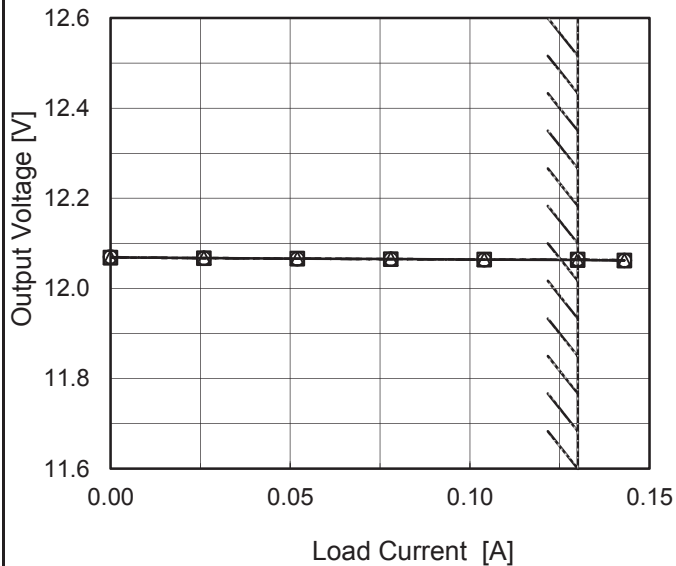
——△——	Input Volt.	18V
– – –□– – –	Input Volt.	24V
—·—○—·—	Input Volt.	36V

Output Voltage [V] vs Load Current [A]

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	12.069	12.068	12.070
0.026	12.068	12.067	12.067
0.052	12.066	12.066	12.066
0.078	12.065	12.065	12.065
0.104	12.064	12.064	12.064
0.130	12.063	12.064	12.064
0.143	12.062	12.062	12.062
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

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Model	MGS1R52412
Item	Dynamic Load Response
Object	+12V0.13A

Temperature   25°C
Testing Circuitry   Figure A

Input Volt.   24 V
Cycle   1000 ms

t1,t2 = 50 μ s

Load Current

t1   t2

Min.Load (0A)←→
  Load 100% (0.13A)

100 mV/div

4 ms/div   4 ms/div

Min.Load (0A)←→
  Load 50% (0.065A)

100 mV/div

4 ms/div   4 ms/div

Load 50% (0.065A)←→
  Load 100% (0.13A)

100 mV/div

4 ms/div   4 ms/div

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Model	MGS1R52412
Item	Ripple Voltage (by Load Current)
Object	+12V0.13A

Temperature 25°C
Testing Circuitry Figure B

1.Graph

2.Values

— △ — Input Volt. 18V
—·—○—·— Input Volt. 36V

Ripple Voltage [mV] (y-axis)
Load Current [A] (x-axis)

Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.000	5	15
0.026	15	10
0.052	25	20
0.078	40	35
0.104	55	45
0.130	60	55
0.143	70	60
--	-	-
--	-	-
--	-	-
--	-	-

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

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Model	MGS1R52412
Item	Ripple-Noise
Object	+12V0.13A

Temperature 25°C
Testing Circuitry Figure B

1.Graph

— △ — Input Volt. 18V
—·—○—·— Input Volt. 36V

Ripple Voltage [mV] vs Load Current [A]

2.Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 18 [V]	Input Volt. 36 [V]
0.000	10	20
0.026	20	15
0.052	30	25
0.078	45	40
0.104	60	50
0.130	65	60
0.143	75	65
--	-	-
--	-	-
--	-	-
--	-	-

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	MGS1R52412
Item	Ripple Voltage (by Ambient Temp.)
Object	+12V0.13A

Testing Circuitry   Figure B

1.Graph

Load 50%
Load 100%

Ambient Temperature [°C]

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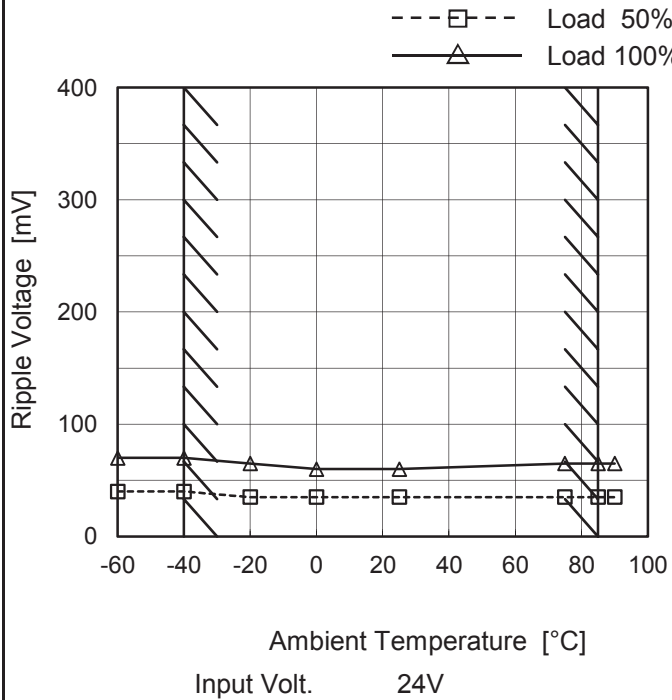
Measured by 100 MHz Oscilloscope.
Note: Slanted line shows the range of the rated
         ambient temperature.

2.Values

Ambient Temperature [°C]	Ripple Voltage [mV]	
	Load 50%	Load 100%
-60	40	70
-40	40	70
-20	35	65
0	35	60
25	35	60
75	35	65
85	35	65
90	35	65
--	-	-
--	-	-
--	-	-

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Model	MGS1R52412
Item	Ambient Temperature Drift
Object	+12V0.13A
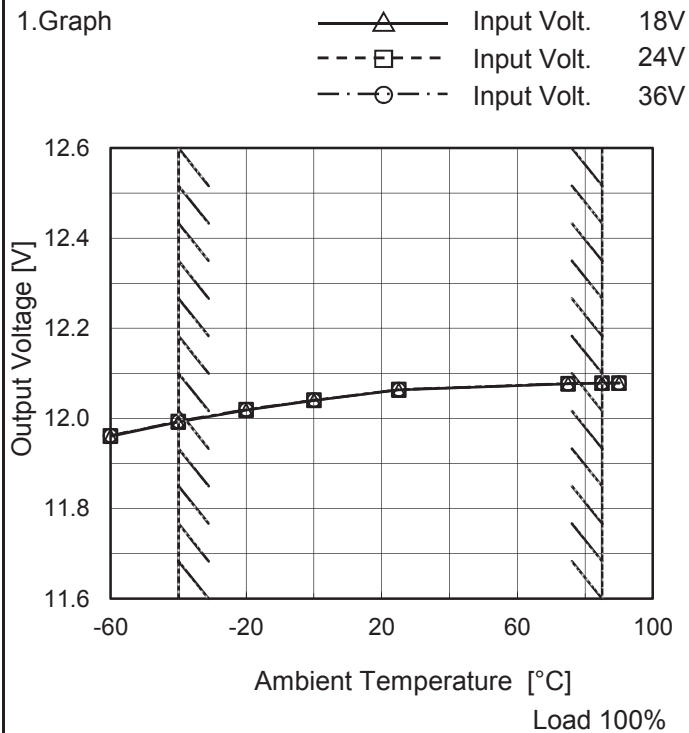
Testing Circuitry   Figure A

1.Graph

	Input Volt.	18V
—△—	Input Volt.	18V
---⊟---	Input Volt.	24V
—·—○—·—	Input Volt.	36V

2.Values

Ambient Temperature [°C]

Load 100%

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

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
-60	11.960	11.961	11.962
-40	11.992	11.993	11.993
-20	12.018	12.019	12.020
0	12.040	12.041	12.041
25	12.063	12.064	12.064
75	12.077	12.077	12.077
85	12.078	12.079	12.079
90	12.078	12.079	12.079
--	-	-	-
--	-	-	-
--	-	-	-

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Model	MGS1R52412	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+12V0.13A	

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 : 18 - 36V

Load Current   : 0 - 0.13A

* 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	36	0	12.087	±48	±0.4
Minimum Voltage	-40	18	0.13	11.992		

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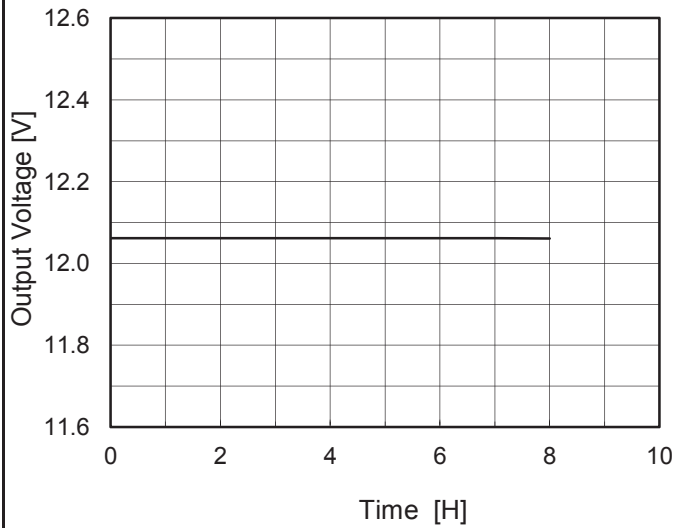|	
Model	MGS1R52412
Item	Time Lapse Drift
Object	+12V0.13A

Temperature　　25°C
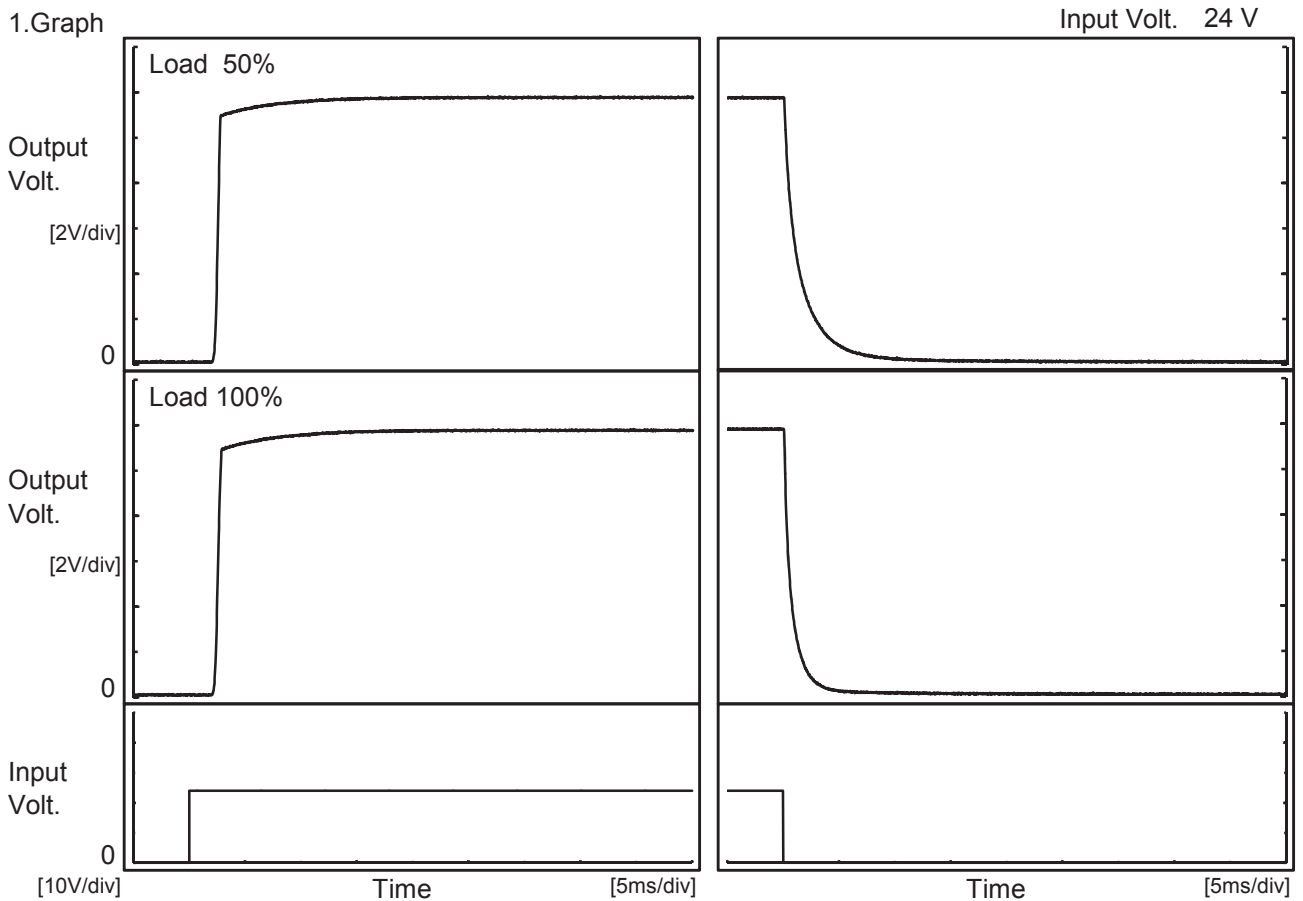Testing Circuitry　Figure A

1.Graph

Input Volt.　　24V
Load　　　　100%

2.Values

Time since start [H]	Output Voltage [V]
0.0	12.061
0.5	12.062
1.0	12.062
2.0	12.062
3.0	12.062
4.0	12.062
5.0	12.062
6.0	12.061
7.0	12.062
8.0	12.061

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Model	MGS1R52412
Item	Rise and Fall Time
Object	+12V0.13A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

Input Volt. 24 V

Load 50%

Output Volt.

[2V/div]

0

Load 100%

Output Volt.

[2V/div]

0

Input Volt.

0

[10V/div]   Time   [5ms/div]

Time   [5ms/div]

2.Values [ms]

Load ＼ Time	Td	Tr	Ts	Th	Tf
50 %	2.4	0.5	2.9	0.2	3.7
100 %	2.3	0.6	2.9	0.1	1.8

Output Volt.

90%

10%

Input Volt.

Td   Tr   Th   Tf

Ts

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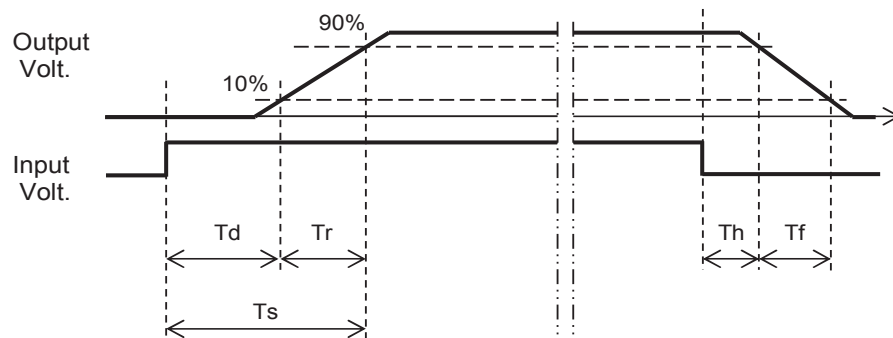
Model	MGS1R52412
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+12V0.13A

Testing Circuitry   Figure A
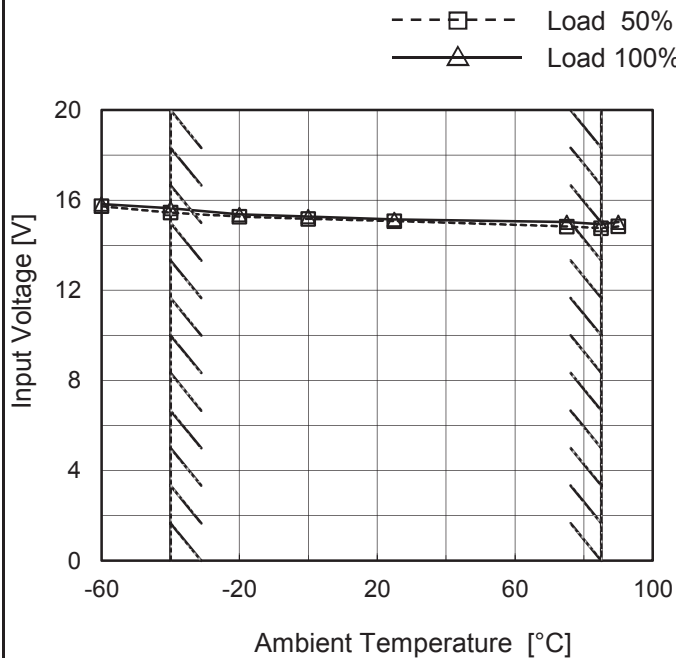
1.Graph

- - -⊟- - -   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	15.8	15.9
-40	15.5	15.7
-20	15.3	15.4
0	15.2	15.3
25	15.1	15.2
75	14.9	15.1
85	14.8	15.0
90	14.9	15.1
--	-	-
--	-	-
--	-	-

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Model	MGS1R52412
Item	Overcurrent Protection
Object	+12V0.13A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

	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. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
12.0	0.13	0.13	0.13
11.4	0.19	0.19	0.19
10.8	0.20	0.20	0.20
9.6	0.21	0.22	0.21
8.4	0.23	0.23	0.22
7.2	0.25	0.25	0.24
6.0	0.27	0.27	0.25
4.8	0.30	0.29	0.27
3.6	0.32	0.31	0.29
2.4	0.35	0.33	0.31
1.2	0.00	0.35	0.32
0.0	0.54	0.50	0.43

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Model	MGS1R52412
Item	Switching frequency (by Load Current)
Object	+12V0.13A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

—△— Input Volt. 18V
- - -□- - - Input Volt. 24V
—·—○—·— Input Volt. 36V

Oscillator Frequency [KHz] vs Load Current [A]

2.Values

Load Current [A]	Frequency [kHz]		
	Input Volt. 18[V]	Input Volt. 24[V]	Input Volt. 36[V]
0.000	541	584	627
0.026	436	486	539
0.052	365	415	470
0.078	312	362	417
0.104	274	319	374
0.130	243	288	341
0.143	236	280	333
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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

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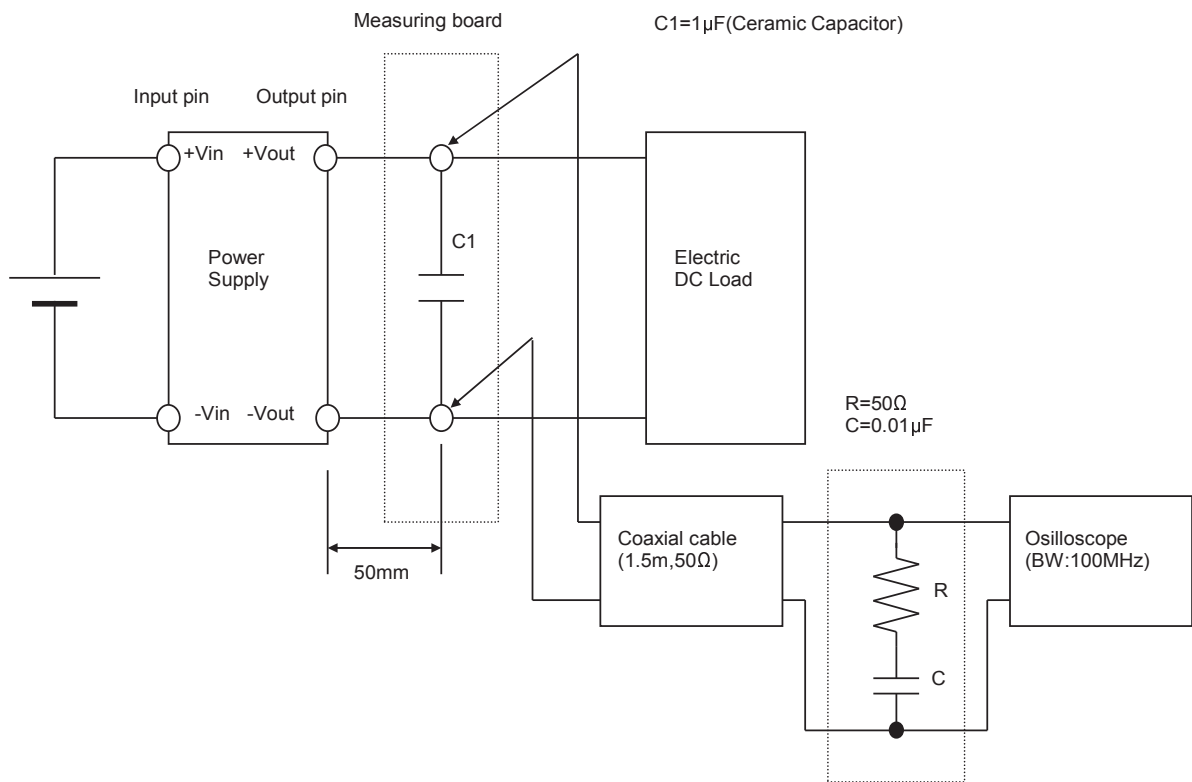so switching frequency would not become constant.

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Figure A

Figure B（Ripple and Ripple noise Characteristic）

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