

DATA SHEET		Date	Mar.29,2002
Model	CDS4004824	Temp.	25 °C
Test	Static electricity immunity test 静電気放電試験	Humid.	45 %Rh
		Tested by	H.Nakayama

1. Method — according to EN61000-4-2 —

(1) Points to be applied voltage

電圧印加箇所

1) Input pin／Output pin／FG terminal, Enclosure

入力ピン／出力ピン／FG端子, ケース

(2) Testing shall be satisfied at the lower levels given below

印加電圧はレベル1から4まで順次実施(下表参照)

(3) Change the polarity (+/-) of applied voltage

印加極性 +/-の条件でそれぞれ実施

(4) For the time interval between successive single discharges an initial value of 1s. is recommended.

On preselected points at least ten single discharges shall be applied.

1秒以上の間隔で各ポイント10回実施

(5) Contact discharge method

接触放電で実施

Test levels of EN61000-4-2

Level	1	2	3	4
Contact discharge [kV]	2	4	6	8
Air discharge [kV]	2	4	8	15

2. Conditions

(1) Input : DC48V

(2) Output : Rated output

(3) Ambient temp. : 25±10°C

(4) Testing circuitry : Refer to item 5

3. Conditions of Acceptability

According to EN50082-2 (EN61000-4-2 Level 2)

EN50082-2(EN61000-4-2 レベル2)を満足すること

4. Result

No.	Level	Voltage [kV]	Polarity	Pin to be tested				
				+VIN	-VIN	+VOUT	-VOUT	FG
1	1	2	+	OK	OK	OK	OK	OK
2			-	OK	OK	OK	OK	OK
3	2	4	+	OK	OK	OK	OK	OK
4			-	OK	OK	OK	OK	OK
5	3	6	+	OK	OK	OK	OK	OK
6			-	OK	OK	OK	OK	OK
7	4	8	+	OK	OK	OK	OK	OK
8			-	OK	OK	OK	OK	OK

All are satisfactory to item 3: OK

5. Testing circuitry

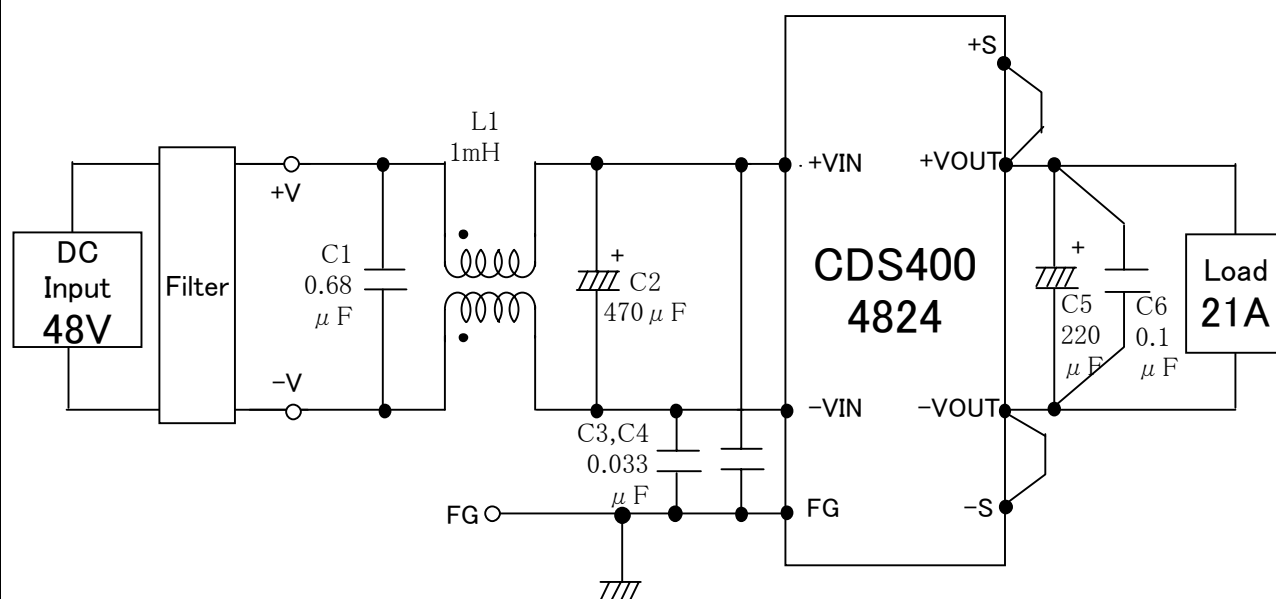


Fig. Testing circuitry

DATA SHEET		Date	Mar.31,2000
Model	CDS4004812	Temp.	25 °C
Test	Radiated, radio-frequency, electromagnetic field immunity test	Humid.	40 %Rh
	放射無線周波電磁界イミュニティ試験	Tested by	Y.Takehashi

1. Method — according to ENV50140 —

These tests are defined for measuring the effect that electromagnetic radiation has on the equipment connected. The tests shall be made in a shielded enclosure.

対象機器に対する電磁放射の影響を測定する。試験はシールドルームで行われること。

- (1) Frequency band : 80MHz to 1000MHz
周波数範囲 : 80MHz から 1000MHz

- (2) Test levels

試験レベル

Test levels of ENV50140

Level	Testing field strength V/m
1	1
2	3
3	10
X	Special

2. Conditions

- (1) Input : DC48V
(2) Output : Rated output
(3) Ambient temp. : $25 \pm 10^{\circ}\text{C}$
(4) Testing circuitry : Fig.1

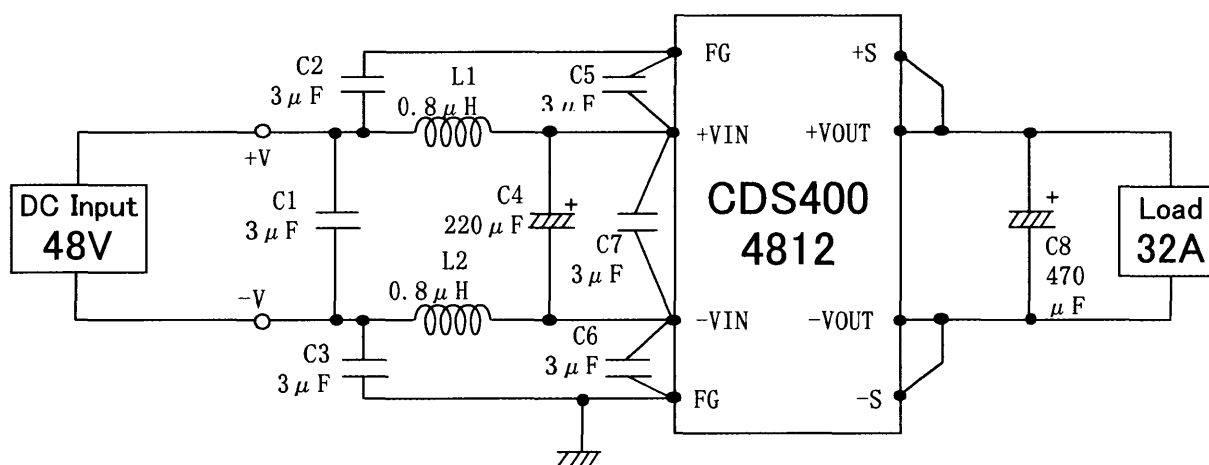


Fig.1 Testing circuitry

3. Conditions of Acceptability

According to EN50082-2 (ENV50140 Level 3)
EN50082-2 (ENV50140 レベル3)を満足すること

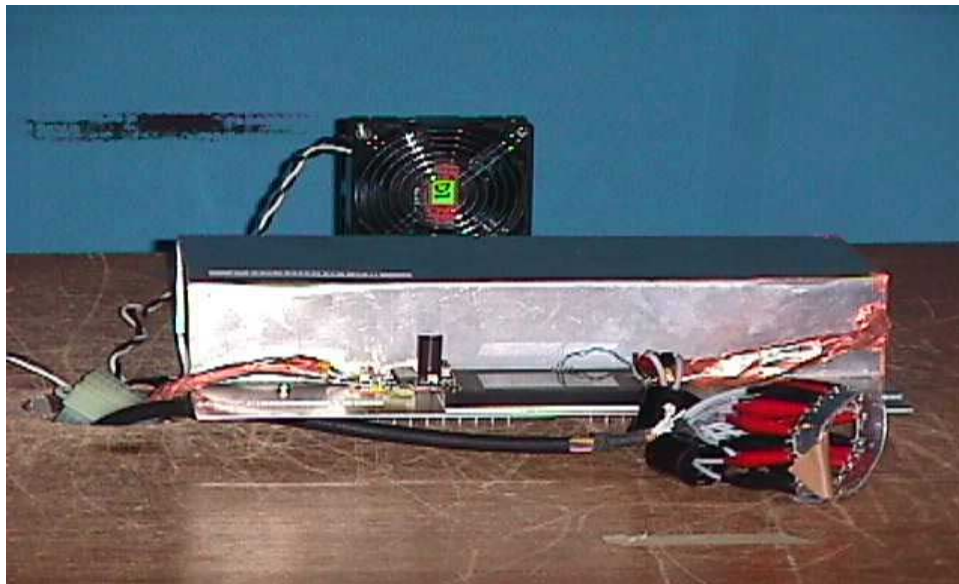
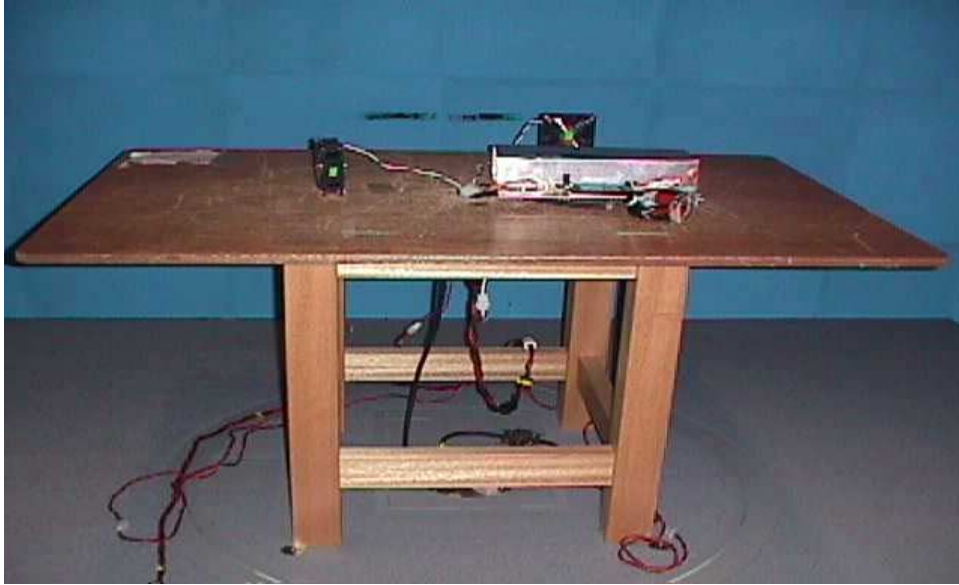
4. Result

No.	Level	Testing field strength [V/m]	Result
1	1	1	OK
2	2	3	OK
3	3	10	OK

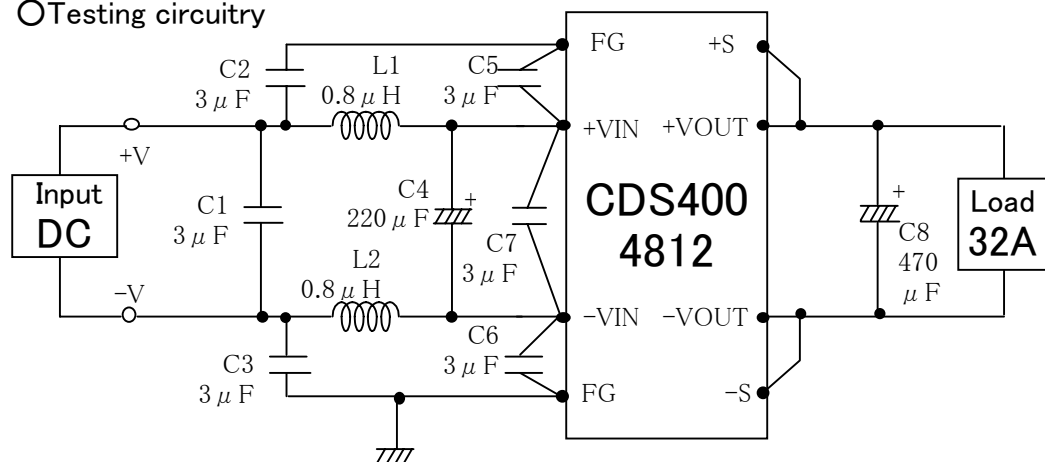
All are satisfactory to item 3: OK

Test : Radiated Susceptability
 Model Name : CDS4004812

○Photographs of Test Set-Up



○Testing circuitry



L1, L2 : ETQP6F0R8LFA (MATSUSHITA)
 C1, C2, C3, C5, C6, C7 : CY55Y5P2A305M (TOKIN)
 C4 : 80V 220 μ F PFseries (nichicon)
 C8 : 25V 470 μ F PWseries (nichicon)

Fig. Testing circuitry

DATA SHEET		Date	Nov.9,2000
Model	CDS4004828	Temp.	25 °C
Test	Radiated, radio-frequency, electromagnetic field immunity test 放射無線周波電磁界イミュニティ試験	Humid.	45 %Rh
		Tested by	H.Nakayama

1. Method — according to ENV50140 —

These tests are defined for measuring the effect that electromagnetic radiation has on the equipment connected. The tests shall be made in a shielded enclosure.

対象機器に対する電磁放射の影響を測定する。試験はシールドルームで行われること。

(1) Frequency band : 80MHz to 1000MHz

周波数範囲 : 80MHz から 1000MHz

(2) Test levels

試験レベル

Test levels of ENV50140

Level	Testing field strength V/m
1	1
2	3
3	10

2. Conditions

- (1) Input : DC48V
- (2) Output : Rated output
- (3) Ambient temp. : $25 \pm 10^{\circ}\text{C}$
- (4) Testing circuitry : Fig.1

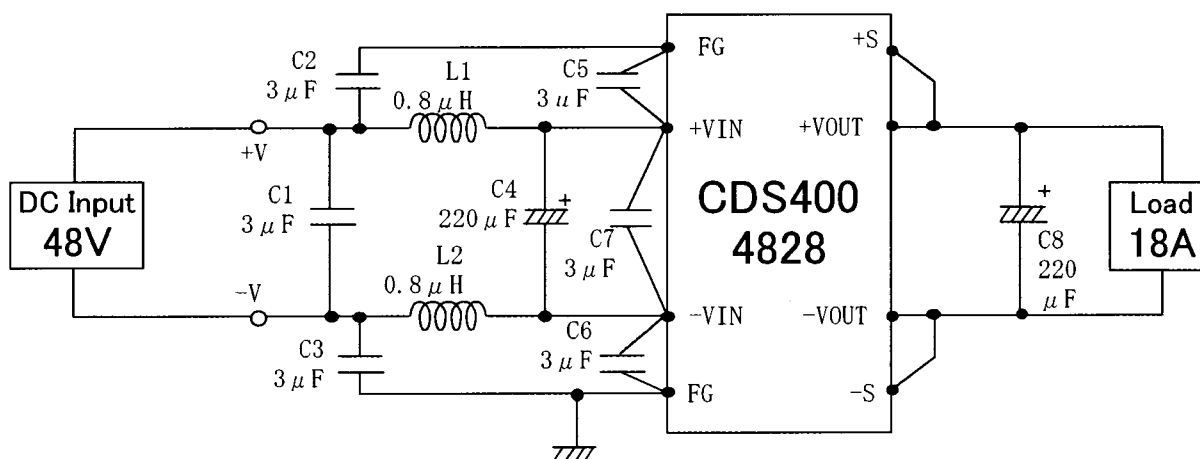


Fig.1 Testing circuitry

3. Conditions of Acceptability

According to EN50082-2 (ENV50140 Level 3)

EN50082-2 (ENV50140 レベル3)を満足すること

4. Result

No.	Level	Testing field strength [V/m]	Result
1	1	1	OK
2	2	3	OK
3	3	10	OK

All are satisfactory to item 3: OK

Conditions

Date 2000/11/9

Test : RADIATED SUSCEPTABILITY
Model No: CDS4004828

○Photographs of Test Set-Up



○Testing circuitry

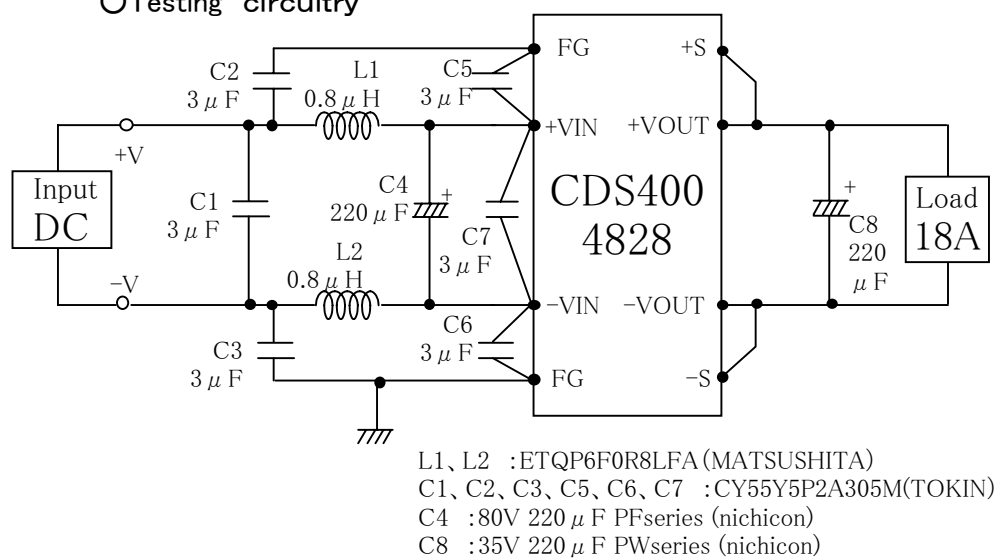


Fig. Testing circuitry

DATA SHEET		Date	Mar.28,2002
Model	CDS4004824	Temp.	25 °C
Test	Electrical fast transient/burst immunity test 電氣的ファーストランジエントバースト試験	Humid.	45 %Rh
		Tested by	H.Nakayama

1. Method — according to EN61000-4-4 —

(1) Points to be applied voltage

電圧印加箇所

1) Between input terminal(+) and ground plane

入力端子(+) — グラント・プレーン間

2) Between input terminal(-) and ground plane

入力端子(-) — グラント・プレーン間

3) Between FG terminal and ground plane

FG端子 — グラント・プレーン間

4) Between output pin and ground plane

出力ピン — グラント・プレーン間

(2) Testing shall be satisfied at the lower levels given below

印加電圧はレベル1から4まで順次実施(下表参照)

(3) Change the polarity (+/-) of applied voltage

印加極性 +/-の条件でそれぞれ実施

(4) The period of applied voltage is 1 minute

電圧印加時間は1分間

Test levels of EN61000-4-4

Level	1	2	3	4
Voltage peak[kV]	0.5	1	2	4
Repetition rate [kHz]	5	5	5	2.5

2. Conditions

(1) Input : DC48V

(2) Output : Rated output

(3) Ambient temp. : 25±10°C

(4) Testing circuitry : Refer to item 5

3. Conditions of Acceptability

According to EN50082-2 (EN61000-4-4 Level 3)

EN50082-2(EN61000-4-4 レベル3)を満足すること

4. Result

No.	Level	Voltage [kV]	Polarity	Terminal and pin to be tested				
				+V	-V	+VOUT	-VOUT	FG
1	1	0.5	+	OK	OK	OK	OK	OK
2			-	OK	OK	OK	OK	OK
3	2	1	+	OK	OK	OK	OK	OK
4			-	OK	OK	OK	OK	OK
5	3	2	+	OK	OK	OK	OK	OK
6			-	OK	OK	OK	OK	OK
7	4	4	+	OK	OK	OK	OK	OK
8			-	OK	OK	OK	OK	OK

All are satisfactory to item 3: OK

5. Testing circuitry

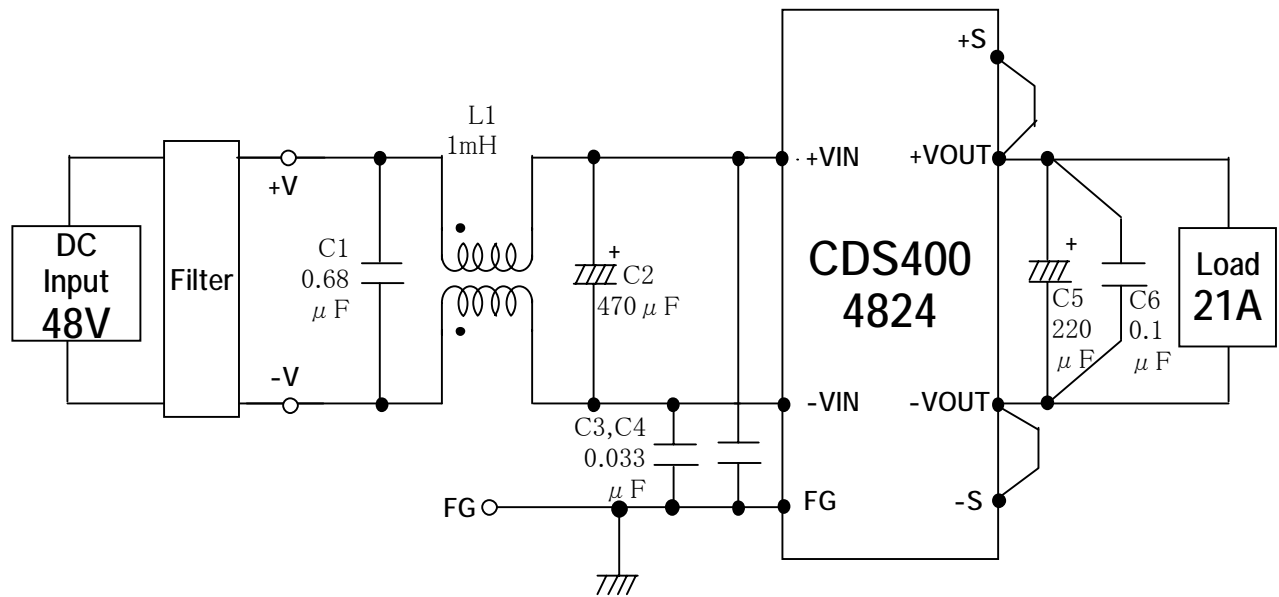


Fig. Testing circuitry

DATA SHEET		Date	Mar.27,2002
Model	CDS4004824	Temp.	25 °C
Test	Surge immunity test サージ・immunity試験	Humid.	45 %Rh
		Tested by	H.Nakayama

1. Method — according to EN61000-4-5 —

(1) Points to be applied voltage

電圧印加箇所

— Line to line (ライン - ライン間 : ノーマル) —

1) Between input terminal (+) and input terminal (-)

入力端子(+) - 入力端子(-)

— Line to FG (ライン - FG間 : コモン) —

2) Between input terminal (+) and FG terminal

入力端子(+) - FG端子

3) Between input terminal (-) and FG terminal

入力端子(-) - FG端子

(2) Test at the selected levels shown below

印加電圧(レベル)は、下表に従う

(3) Change the polarity (+/-) of applied voltage

印加極性 +/- の条件でそれぞれ実施

(4) Number of tests : Six positive and six negative at selected points.

試験の回数 : それぞれの印加箇所、正負各6回試験する

(5) Repetition rate : maximum 1/min.

繰り返し速度 : 最大1回/分 (1分以上の間隔をおく)

Test levels of EN61000-4-5

Level	1	2	3	4
Test voltage [kV]	0.5	1	2	4

2. Conditions

(1) Input : DC48V

(2) Output : Rated output

(3) Ambient temp. : 25±10°C

(4) Testing circuitry : Refer to item 5

3. Conditions of Acceptability

Line to line : According to EN50082-2 (EN61000-4-5 Level 3)

ライン - ライン間 (ノーマル) : EN50082-2(EN61000-4-5 レベル3)を満足すること

Line to earth : According to EN50082-2 (EN61000-4-5 Level 4)

ライン - FG間 (コモン) : EN50082-2(EN61000-4-5 レベル4)を満足すること

4. Result

No.	Voltage [kV]	Polarity	Line (+) - Line (-)
1	0.5	+	OK
2		-	OK
3	1	+	OK
4		-	OK
5	2	+	OK
6		-	OK

No.	Voltage [kV]	Polarity	Line (+) - FG	Line (-) - FG
1	0.5	+	OK	OK
2		-	OK	OK
3	1	+	OK	OK
4		-	OK	OK
5	2	+	OK	OK
6		-	OK	OK
7	4	+	OK	OK
8		-	OK	OK

All are satisfactory to item 3: OK

5. Testing circuitry

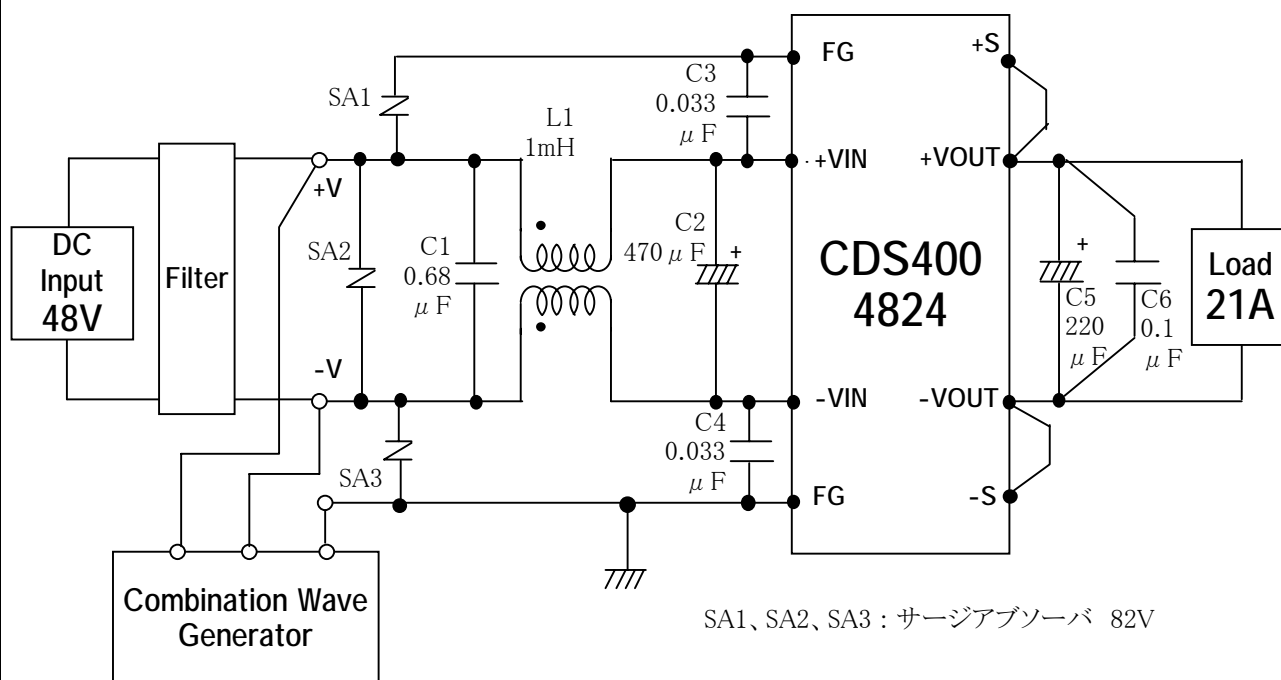


Fig. Testing circuitry

DATA SHEET		Date	Apr.4,2000
Model	CDS4004812	Temp.	25 °C
Test	Immunity to conducted disturbances, induced by radio-frequency fields 伝導性無線周波数電磁界イミュニティ試験	Humid.	40 %Rh
		Tested by	Y.Takehashi

1. Method — according to ENV50141 —

(1) Points to be applied signals

信号印加箇所

1) Between input terminal(+) and terminal(-)

入力端子(+) — 入力端子(-)間

(2) Testing shall be satisfied at the lower levels given below

印加信号はレベル1から3まで順次実施(下表参照)

Test levels of ENV50141

No.	Level	Frequency range 150kHz - 80MHz	
		Voltage level (e.m.f.)	
		Vo[dB(μV)]	Vo[V]
1	1	120	1
2	2	130	3
3	3	140	10
4	X	Special	

2. Conditions

(1) Input : DC48V

(2) Output : Rated output

(3) Ambient temp. : 25±10°C

(4) Testing circuitry : Fig.1

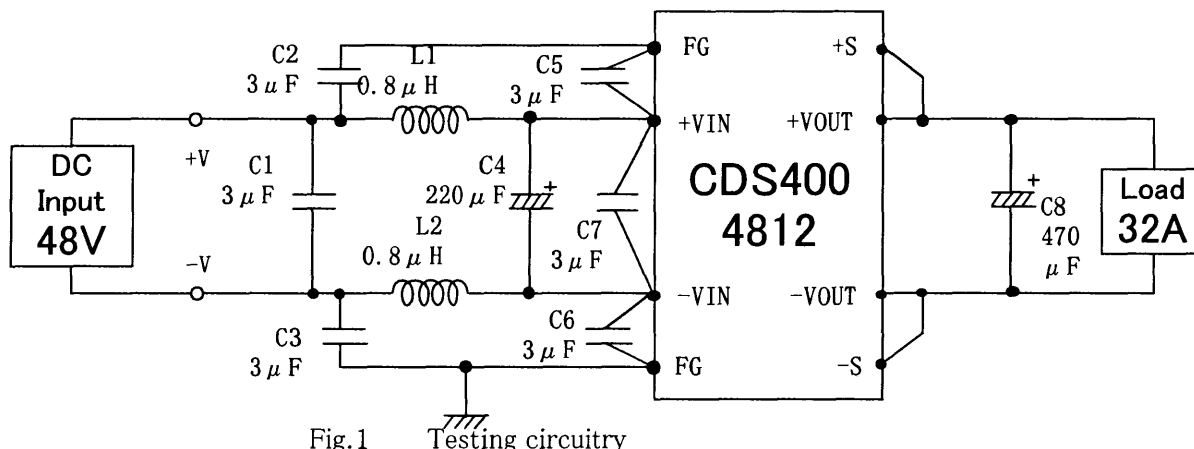


Fig.1 Testing circuitry

3. Conditions of Acceptability

According to EN50082-2 (ENV50141 Level 3) - IEC1000-4-6

EN50082-2(ENV50141 レベル3) - IEC1000-4-6を満足すること

4. Result

No.	Frequency range 150kHz - 80MHz			Result
	Level	Voltage level (e.m.f.)		
		Vo [dB(μV)]	Vo [V]	
1	1	120	1	OK
2	2	130	3	OK
3	3	140	10	OK

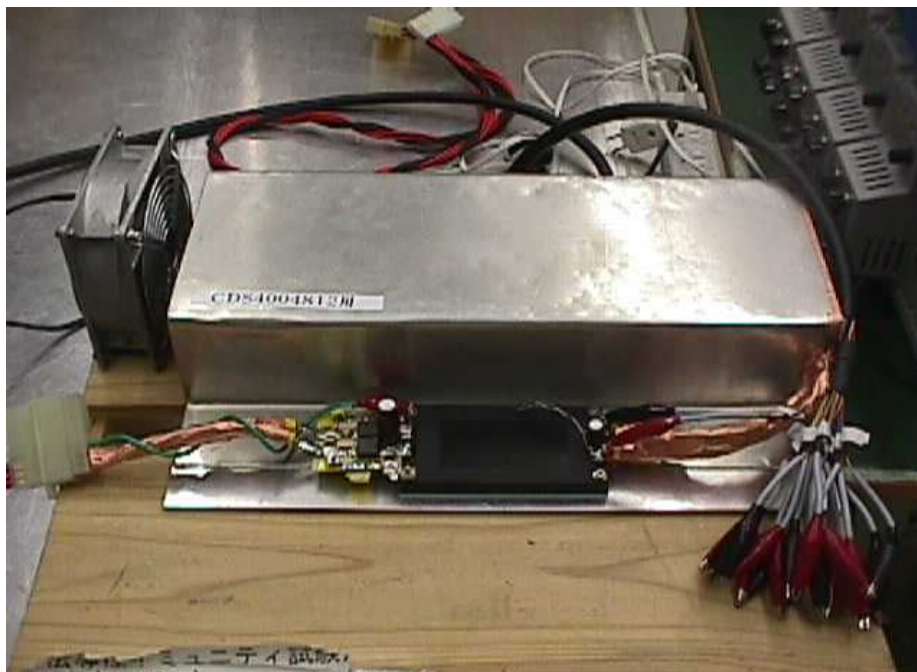
All are satisfactory to item 3: OK

Conditions

Date 2000/4/4

Test : Conductive Susceptability
 Model Name : CDS4004812

○Photographs of Test Set-Up



○Testing circuitry

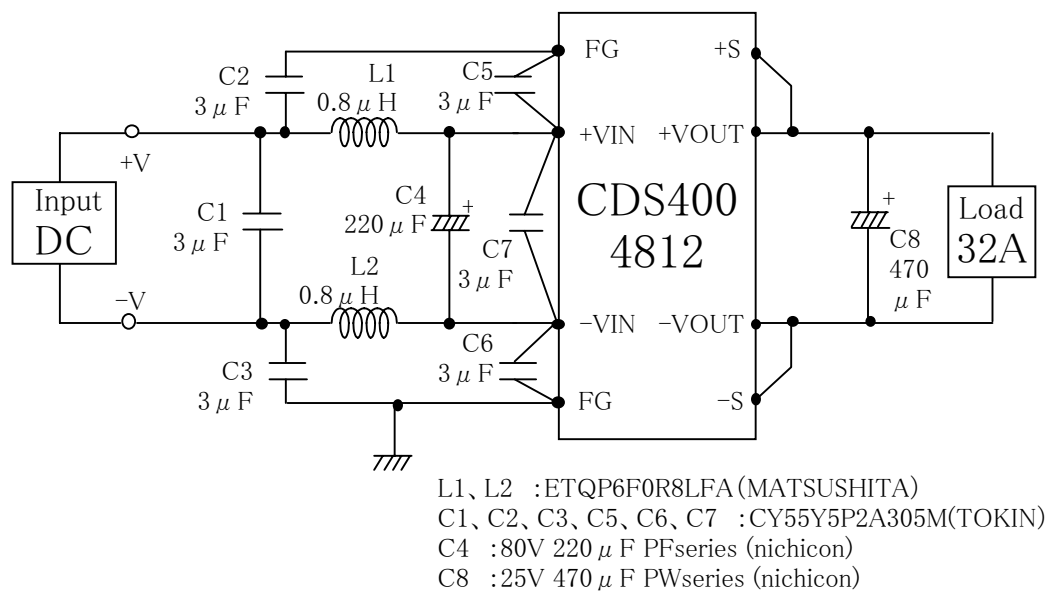


Fig. Testing circuitry

DATA SHEET		Date	Nov.17,2000
Model	CDS4004828	Temp.	25 °C
Test	Immunity to conducted disturbances, induced by radio-frequency fields 伝導性無線周波数電磁界イミュニティ試験	Humid.	45 %Rh
		Tested by	H.Nakayama

1. Method — according to ENV50141 —

(1) Points to be applied signals

信号印加箇所

1) Between input terminal(+) and terminal(-)

入力端子(+) — 入力端子(-)間

(2) Testing shall be satisfied at the lower levels given below

印加信号はレベル1から3まで順次実施(下表参照)

Test levels of ENV50141

No.	Level	Frequency range 150kHz ~ 80MHz	
		Voltage level (e.m.f.)	
		V_o [dB(μ V)]	V_o [V]
1	1	120	1
2	2	130	3
3	3	140	10

2. Conditions

- (1) Input : DC48V
- (2) Output : Rated output
- (3) Ambient temp. : $25 \pm 10^\circ\text{C}$
- (4) Testing circuitry : Fig.1

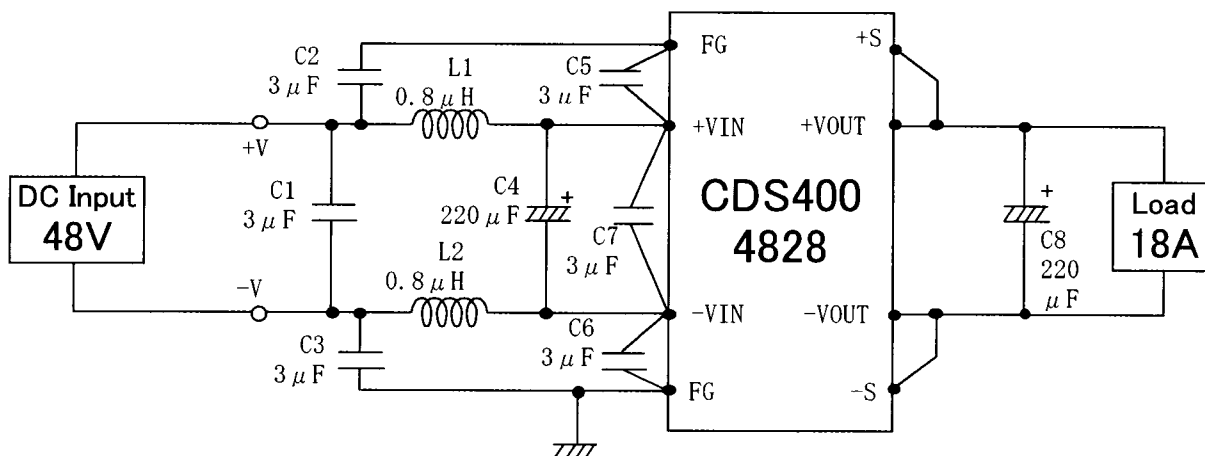


Fig.1 Testing circuitry

3. Conditions of Acceptability

According to EN50082-2 (ENV50141 Level 3) - IEC1000-4-6
EN50082-2(ENV50141 レベル3) - IEC1000-4-6を満足すること

4. Result

No.	Frequency range 150kHz – 80MHz			Result
	Level	Voltage level (e.m.f.)		
		Vo[dB(μ V)]	Vo[V]	
1	1	120	1	OK
2	2	130	3	OK
3	3	140	10	OK

All are satisfactory to item 3: OK

Conditions

Date 2000/11/17

Test : Conductive Susceptability

Model Name : CDS4004828

○Photographs of Test Set-Up



○Testing circuitry

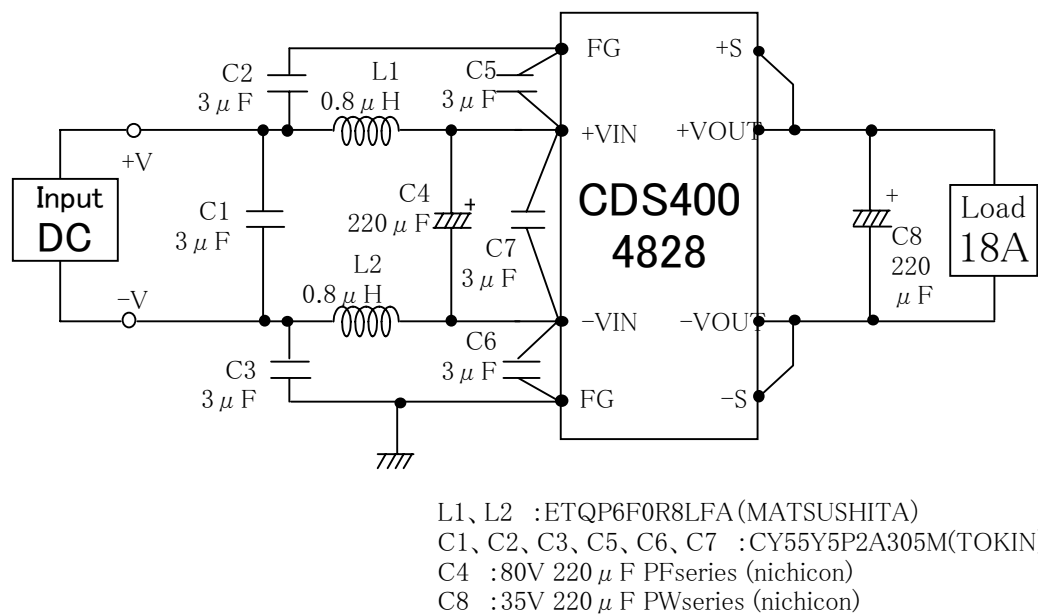


Fig. Testing circuitry

DATA SHEET		Date	Mar.27,2000
Model	CDS4004812	Temp.	25 °C
Test	Voltage dips, short interruptions and voltage variations immunity test	Humid.	40 %Rh
	電圧ディップ・一時瞬断・変動試験	Tested by	Y.Kawagishi

1. Method — according to EN61000-4-11 —

These tests are defined for evaluating the immunity of switching power supply when subjected to voltage dips, short interruptions and voltage variations.
 この試験は、入力電圧に電圧低下、一時的遮断及び電圧変動が発生した場合の電源出力特性を評価する。

(1) Voltage dips test
 電圧低下試験
 Specification 1

- 1) Test level : 30% reduction of input voltage
 試験レベル：入力電圧の30%低下
- 2) The period of dips is 10mS
 低下時間は10mS
- 3) Numbers of tests : 3 times
 試験回数：3回
- 4) Interval : 10s min
 試験間隔：10秒以上

Specification 2

- 1) Test level : 60% reduction of input voltage
 試験レベル：入力電圧の60%低下
- 2) The period of interruptions is 100mS
 遮断時間は100mS
- 3) Number of tests : 3 times
 試験の回数：3回
- 4) Interval : 10s min
 試験間隔：10秒以上

(2) Short interruptions test : 一時的遮断試験

- 1) Test level : 95% reduction of input voltage
 試験レベル：入力電圧の95%低下
- 2) The period of interruptions is 5000mS
 遮断時間は5000mS
- 3) Number of tests : 3 times
 試験の回数：3回
- 4) Interval : 10s min
 試験間隔：10秒以上

(3) Voltage variations test : 電圧変動試験

- 1) Test level : ±10% variation of input voltage
 試験レベル：入力電圧の±10%変動
- 2) The period of variation is 15 minutes
 変動時間は15分間

2. Conditions

- (1) Input : DC48V
- (2) Output : Rated output
- (3) Ambient temp. : 25±10°C
- (4) Testing circuitry : Refer to item 5

3. Conditions of Acceptability
 According to EN50082-2 (EN61000-4-11)
 EN50082-2 (EN61000-4-11) を満足すること

4. Result

- (1) Voltage dips : OK
- (2) Short interruptions : OK
- (3) Voltage variations : OK

All are satisfactory to item 3: OK

5. Testing circuitry

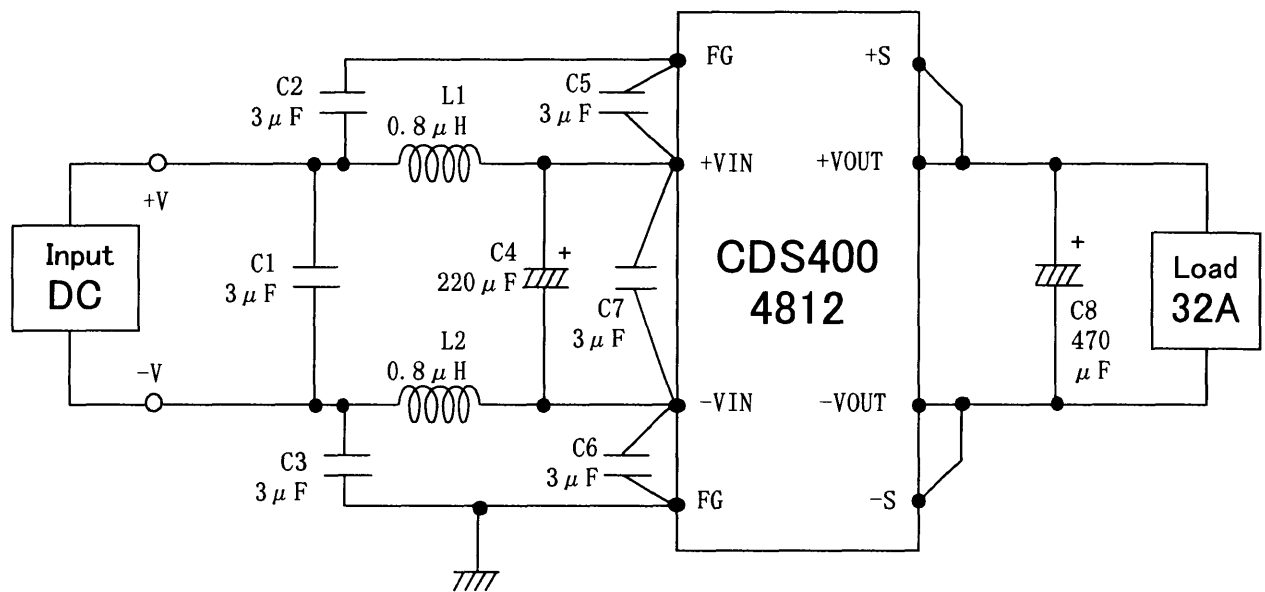


Fig. Testing circuitry

DATA SHEET		Date	Nov.10,2000
Model	CDS4004828	Temp.	25 °C
Test	Voltage dips, short interruptions and voltage variations immunity test 電圧ディップ・一時瞬断・変動試験	Humid.	45 %Rh
		Tested by	H.Nakayama

1. Method — according to EN61000-4-11 —

These tests are defined for evaluating the immunity of switching power supply when subjected to voltage dips, short interruptions and voltage variations.

この試験は、入力電圧に電圧低下、一時的遮断及び電圧変動が発生した場合の電源出力特性を評価する。

(1) Voltage dips test

電圧低下試験

Specification 1

- 1) Test level : 30% reduction of input voltage
試験レベル：入力電圧の30%低下
- 2) The period of dips is 10mS
低下時間は10mS
- 3) Numbers of tests : 3 times
試験回数：3回
- 4) Interval : 10s min
試験間隔：10秒以上

Specification 2

- 1) Test level : 60% reduction of input voltage
試験レベル：入力電圧の60%低下
- 2) The period of interruptions is 100mS
遮断時間は100mS
- 3) Number of tests : 3 times
試験の回数：3回
- 4) Interval : 10s min
試験間隔：10秒以上

(2) Short interruptions test : 一時的遮断試験

- 1) Test level : 95% reduction of input voltage
試験レベル：入力電圧の95%低下
- 2) The period of interruptions is 5000mS
遮断時間は5000mS
- 3) Number of tests : 3 times
試験の回数：3回
- 4) Interval : 10s min
試験間隔：10秒以上

(3) Voltage variations test : 電圧変動試験

- 1) Test level : $\pm 10\%$ variation of input voltage
試験レベル：入力電圧の $\pm 10\%$ 変動
- 2) The period of variation is 15 minutes
変動時間は15分間

2. Conditions

- (1) Input : DC48V
- (2) Output : Rated output
- (3) Ambient temp. : $25 \pm 10^\circ\text{C}$
- (4) Testing circuitry : Refer to item 5

3. Conditions of Acceptability

According to EN50082-2 (EN61000-4-11)
EN50082-2 (EN61000-4-11) を満足すること

4. Result

- (1) Voltage dips : OK
- (2) Short interruptions : OK
- (3) Voltage variations : OK

All are satisfactory to item 3: OK

5. Testing circuitry

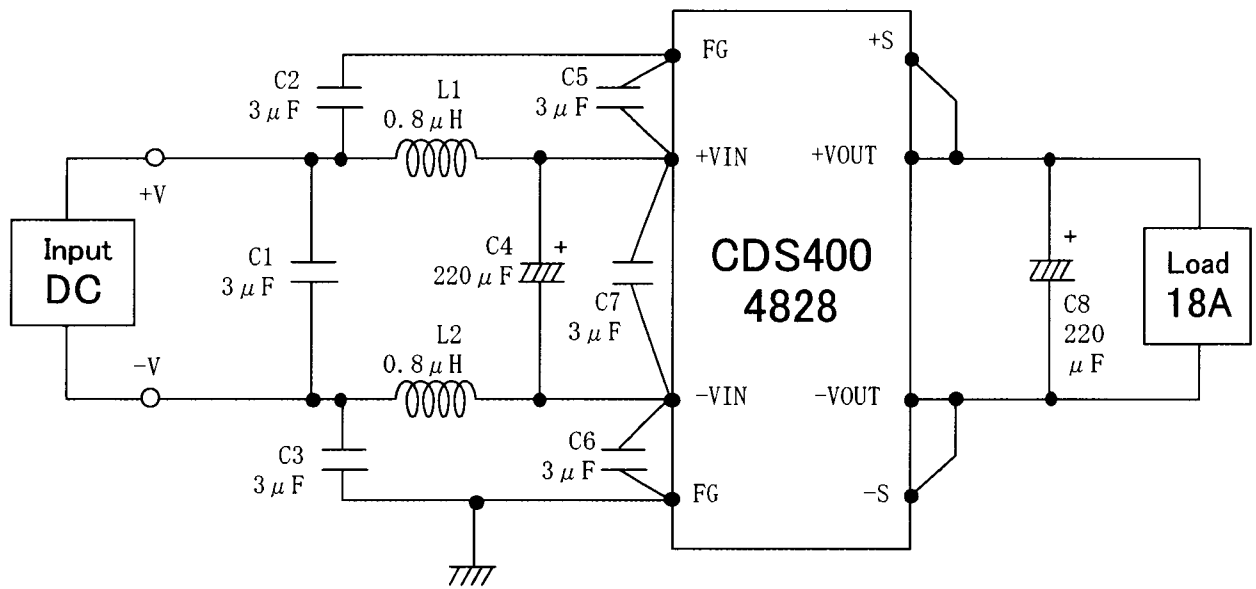


Fig. Testing circuitry