

PAE100S48-*

EVALUATION DATA

型式データ

DWG.No. C178-53-02A		
承認	査閲	担当
<i>Kurodawa</i> 24. July '08	<i>Y. Kihara</i> 24. Jul. '08	<i>T. Hashikawa</i> 24. July '08

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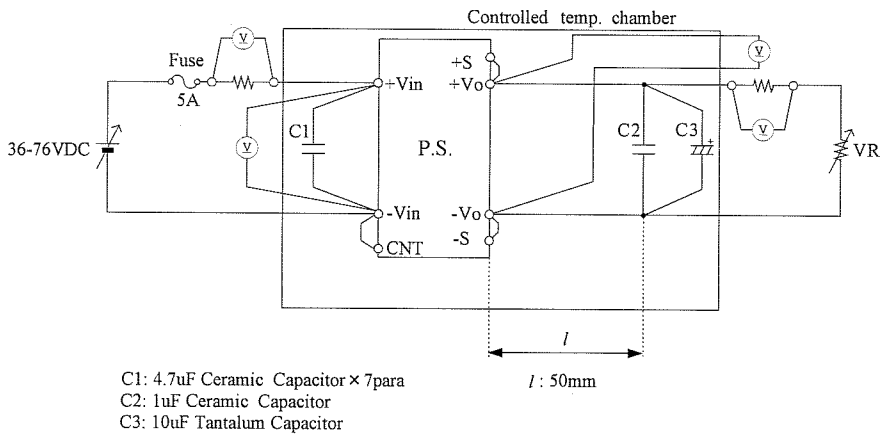
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使用記号 Terminology used

	Definition	
V_{in} 入力電圧	Input Voltage
V_{out} 出力電圧	Output Voltage
V_{CNT} CNT電圧	CNT Voltage
I_{in} 入力電流	Input Current
I_{out} 出力電流	Output Current
T_a 周囲温度	Ambient Temperature

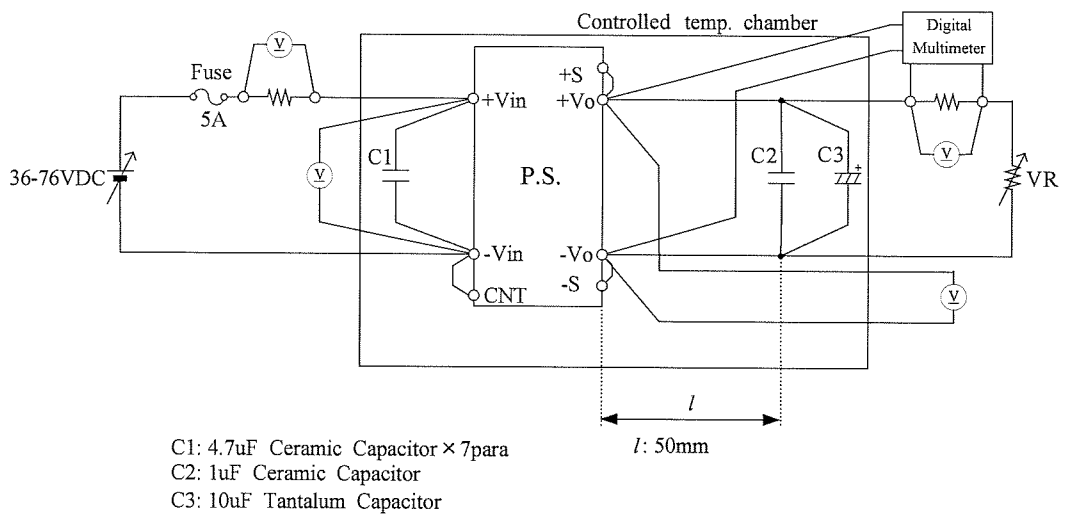
- 1. 測定方法 Evaluation Method
- 1.1 測定回路 Circuits used for determination
- (1) 静特性 Steady state characteristics



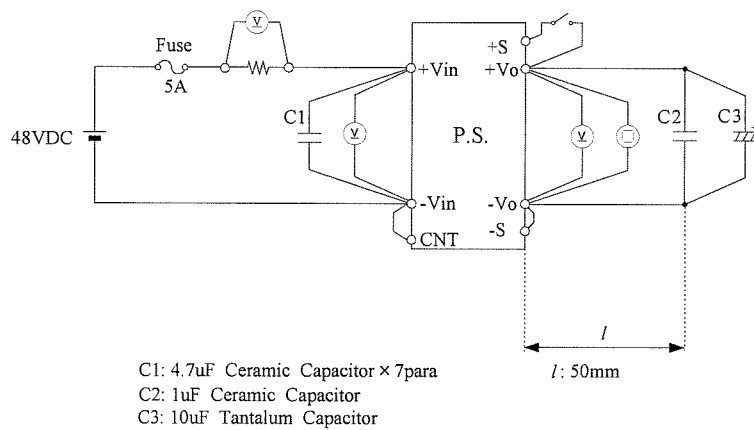
- (2) 通電ドリフト Warm up voltage drift characteristics

静特性と同じ
 Same as Steady state data

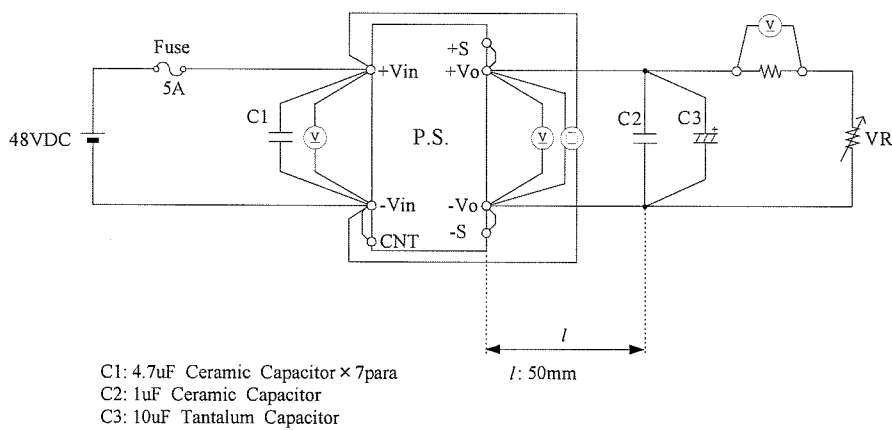
- (3) 過電流保護特性 Over current protection (OCP) characteristics



(4) 過電圧保護特性 Over voltage protection (OVP) characteristics



(5) 出力立ち上がり特性 Output rise characteristics

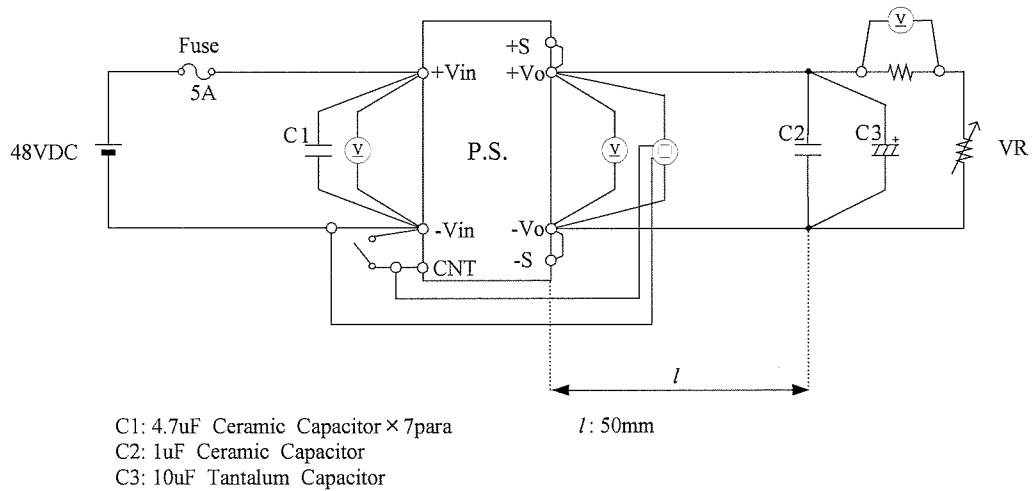


(6) 出力立ち下がり Output fall characteristics

出力立ち上がり特性と同じ
 Same as output rise characteristics

(7) 出力立ち上がり特性 (ON/OFFコントロール時)

Output rise characteristics with ON/OFF CONTROL

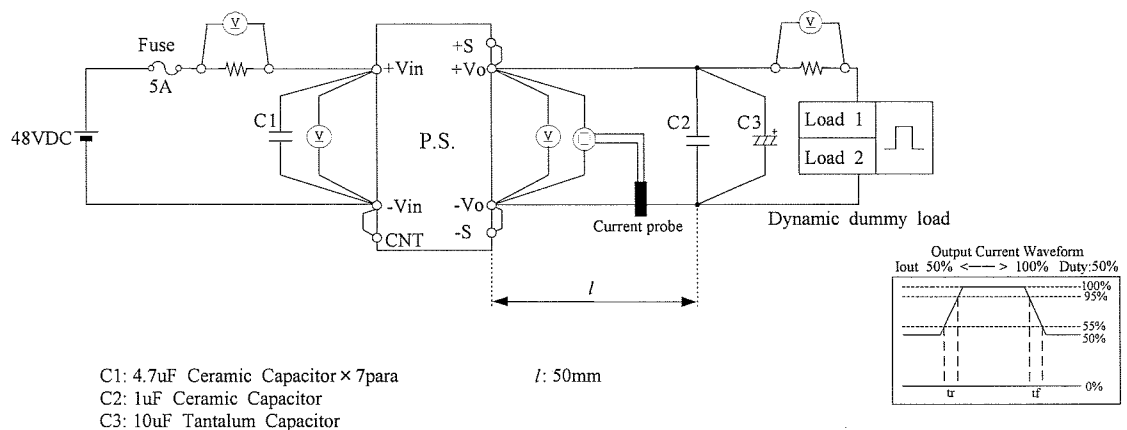


(8) 出力立ち下がり特性 (ON/OFFコントロール時)

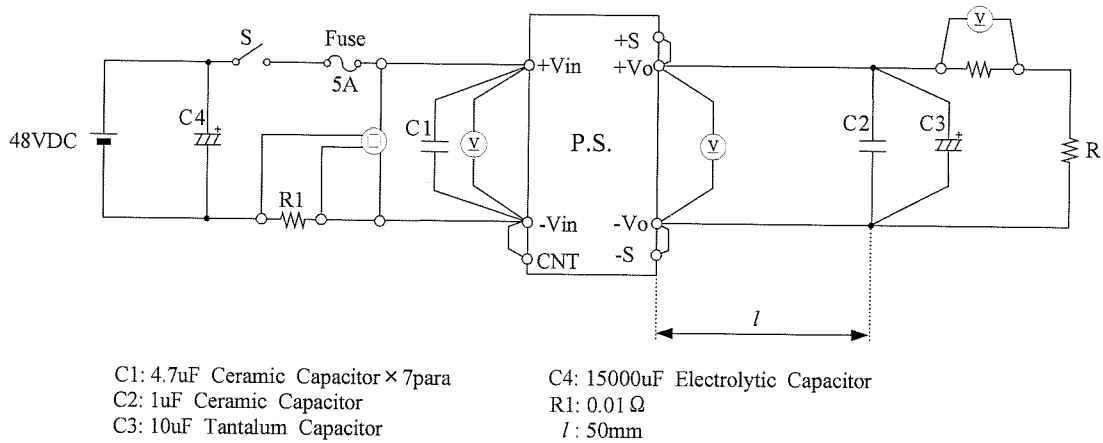
Output fall characteristics with ON/OFF CONTROL

出力立ち上がり特性 (ON/OFFコントロール時) と同じ
 Same as output rise characteristics with ON/OFF CONTROL

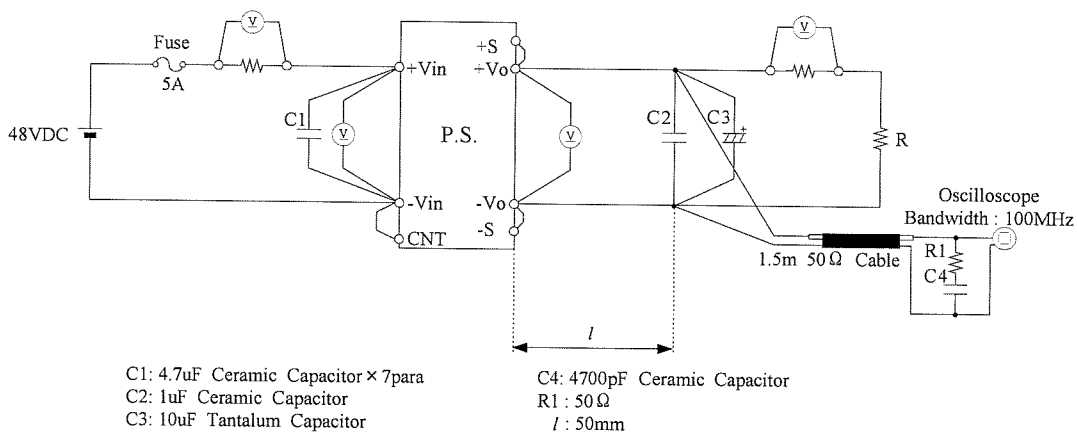
(9) 過渡応答(負荷急変)特性 Dynamic load response characteristics



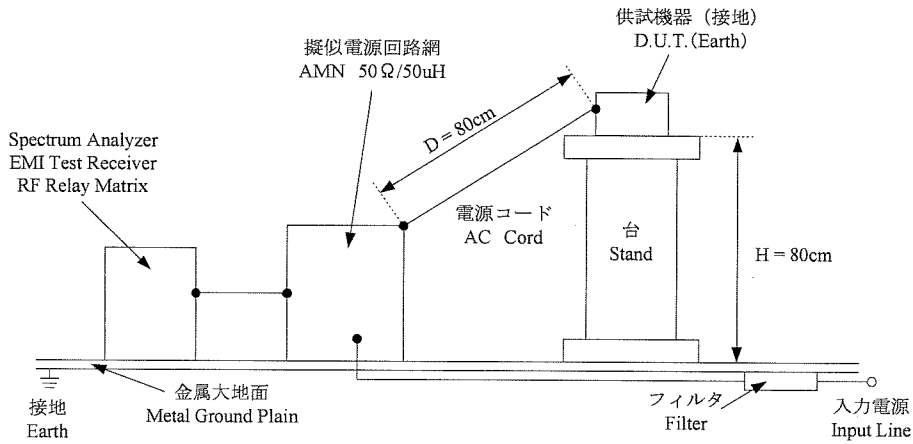
(10) 入力サージ電流 (突入電流) 特性 Inrush current characteristics



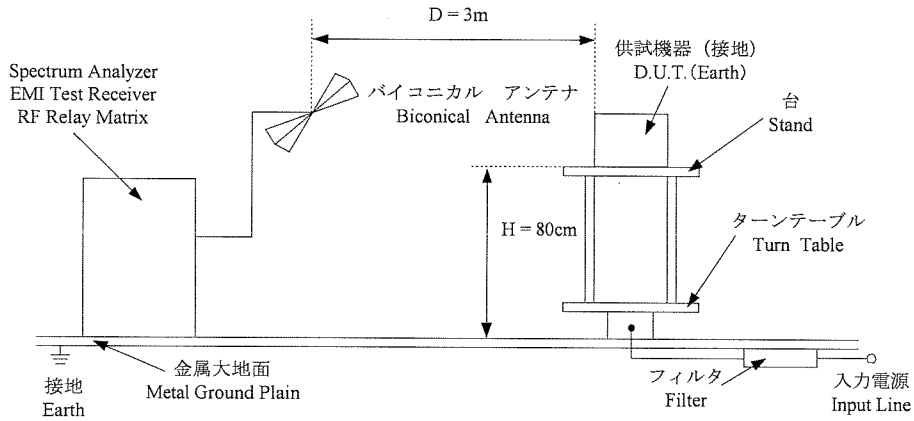
(11) 出力リップル、ノイズ波形 Output ripple and noise waveform



(12) EMI 特性 Electro-Magnetic Interference characteristics



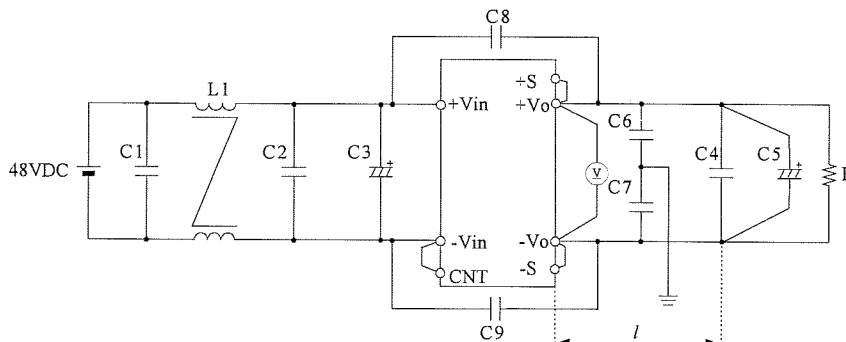
(a) 雑音端子電圧 (帰還ノイズ) Conducted Emission Noise



(b) 雑音電界強度 (輻射ノイズ) Radiated Emission Noise

(1) VCC class A 対応アプリケーションシステム

VCCI class A application system



- L1: 680μH
- C1, C2: 1μF Ceramic Capacitor
- C3: 470μF Electrolytic Capacitor × 2 para
- C4: 1μF Ceramic Capacitor
- C5: 10μF Tantalum Capacitor
- C6, C7: 0.1μF Ceramic Capacitor
- C8, C9: 0.047μF Ceramic Capacitor
- l: 50mm

1.2 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	OSCILLO SCOPE	HITACHI DENSHI	V-1100A
2	DIGITAL STORAGE OSCILLOSCOPE	TEKTRONIX	TDS540
3	DIGITAL MULTIMETER	AGILENT	34970A
4	CURRENT PROBE/AMPLIFIER	TEKTRONIX	A6303/AM503
5	SHUNT RESISTOR	YOKOGAWA ELECT.	2215
6	CARBON PLATE RHEOSTATS	YAMABISHI ELECT.	RC-3
7	CONTROLLED TEMP. CHANBER	TABAI ESPEC	SH-240
8	SPECTRUM ANALYZER	ROHDE & SCHWARZ	FSA
9	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESHS10
10	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESVS10
11	RF RELAY MATRIX	ROHDE & SCHWARZ	PSU
12	AMN	KYORITSU	KNW-242
13	ANTENNA(BICONICAL ANTENNA)	SCHWARZBECK	BBA9106
14	DYNAMIC DUMMY LOAD	TAKASAGO	FK-400L
15	AC POWER SUPPLY	TAKASAGO	AA2000XG

2. 特性データ

2.1 静特性 Steady state data

(1) 入力、負荷、温度変動 Regulation - line and load, temperature drift

1.8V

1. Regulation - line and load

condition Ta : 25°C

Air Velocity: 2m/s

Iout \ Vin	36VDC	48VDC	76VDC	line regulation	
0%	1.8102V	1.8108V	1.8109V	0.7mV	0.039%
50%	1.8100V	1.8104V	1.8106V	0.6mV	0.033%
100%	1.8099V	1.8104V	1.8104V	0.5mV	0.028%
load	0.3mV	0.4mV	0.5mV		
regulation	0.017%	0.022%	0.028%		

2. Temperature drift

conditions Vin : 48VDC

Iout : 100%

Air Velocity: 2m/s

Ta	-40°C	25°C	80°C	temperature stability	
Vout	1.7966V	1.8104V	1.8201V	23.5mV	1.306%

3.3V

1. Regulation - line and load

condition Ta : 25°C

Air Velocity: 2m/s

Iout \ Vin	36VDC	48VDC	76VDC	line regulation	
0%	3.3124V	3.3134V	3.3140V	1.6mV	0.048%
50%	3.3120V	3.3129V	3.3135V	1.5mV	0.045%
100%	3.3120V	3.3128V	3.3134V	1.4mV	0.042%
load	0.4mV	0.6mV	0.6mV		
regulation	0.012%	0.018%	0.018%		

2. Temperature drift

conditions Vin : 48VDC

Iout : 100%

Air Velocity: 2m/s

Ta	-40°C	25°C	80°C	temperature stability	
Vout	3.2922V	3.3128V	3.3254V	33.2mV	1.006%

2. 特性データ

2.1 静特性 Steady state data

(1) 入力、負荷、温度変動 Regulation - line and load, temperature drift

5V

1. Regulation - line and load

condition Ta : 25°C

Air Velocity: 2m/s

Iout \ Vin	36VDC	48VDC	76VDC	line regulation	
0%	5.0207V	5.0173V	5.0162V	4.5mV	0.090%
50%	5.0205V	5.0179V	5.0171V	3.4mV	0.068%
100%	5.0208V	5.0188V	5.0182V	2.6mV	0.052%
load regulation	0.3mV	1.5mV	2.0mV		
	0.006%	0.030%	0.040%		

2. Temperature drift

conditions Vin : 48VDC

Iout : 100%

Air Velocity: 2m/s

Ta	-40°C	25°C	60°C	temperature stability	
Vout	4.9838V	5.0188V	5.0365V	52.7mV	1.054%

2.1 (2) 出力電圧、リップル電圧対入力電圧

Output voltage and ripple voltage vs input voltage

Conditions Iout : 100 %

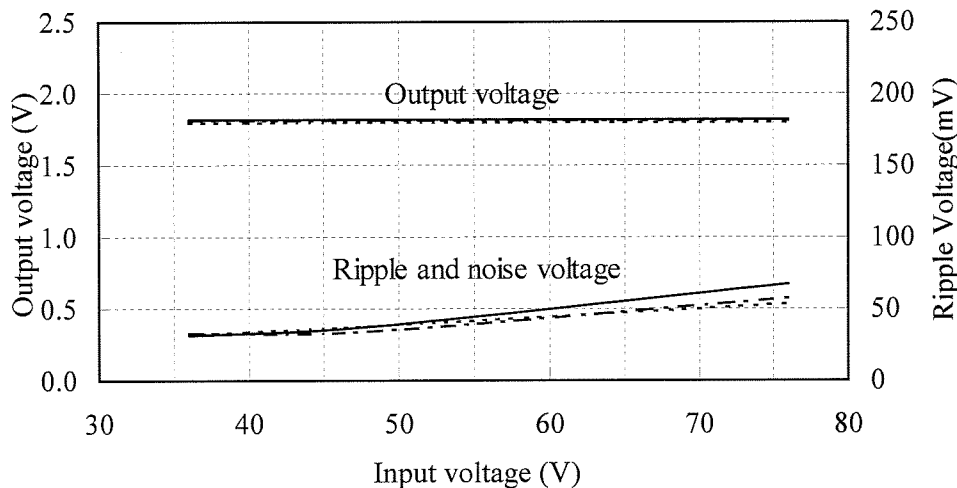
Ta : -40 °C -----

25 °C - - - - -

80 °C _____

Air Velocity : 2m/s

1.8V



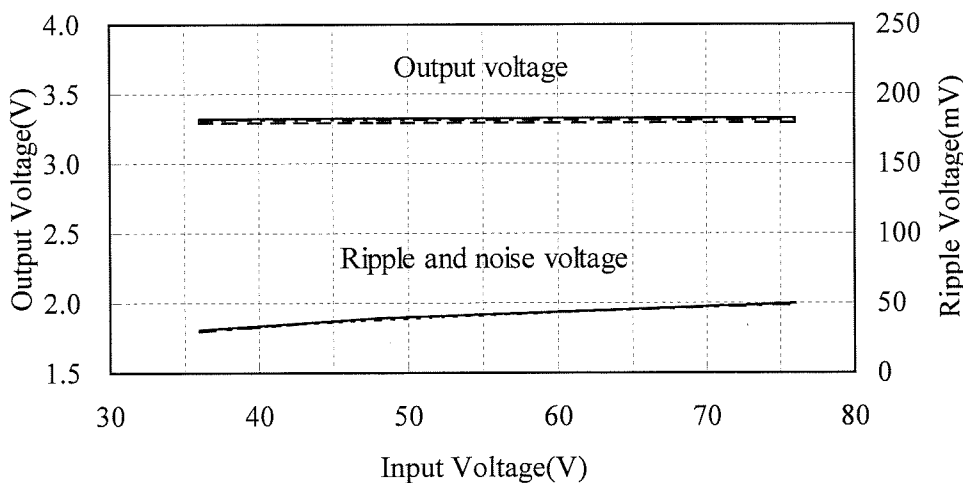
Ta : -40 °C -----

25 °C - - - - -

80 °C _____

Air Velocity : 2m/s

3.3V



2.1 (2) 出力電圧、リップル電圧対入力電圧
Output voltage and ripple voltage vs input voltage

Conditions Iout : 100 %

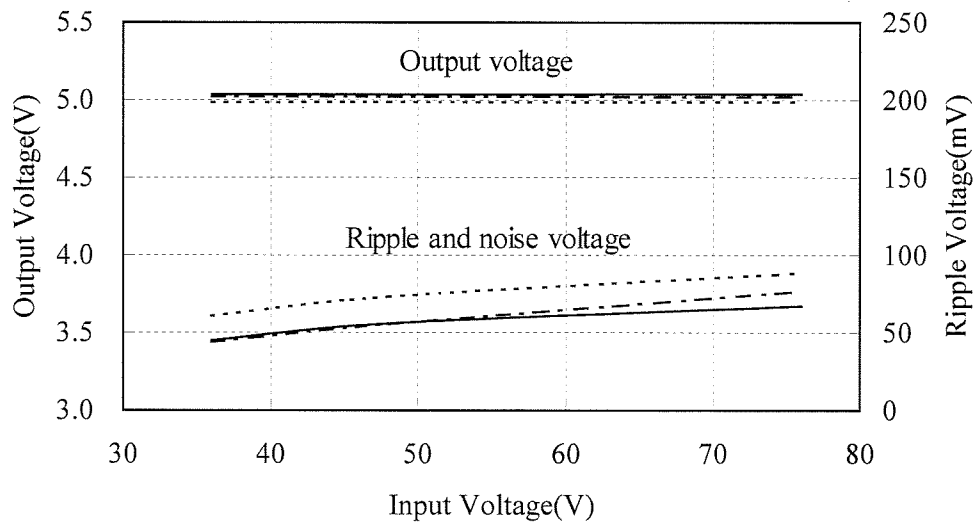
Ta : -40 °C -----

25 °C - - - - -

60 °C _____

Air Velocity : 2m/s

5V

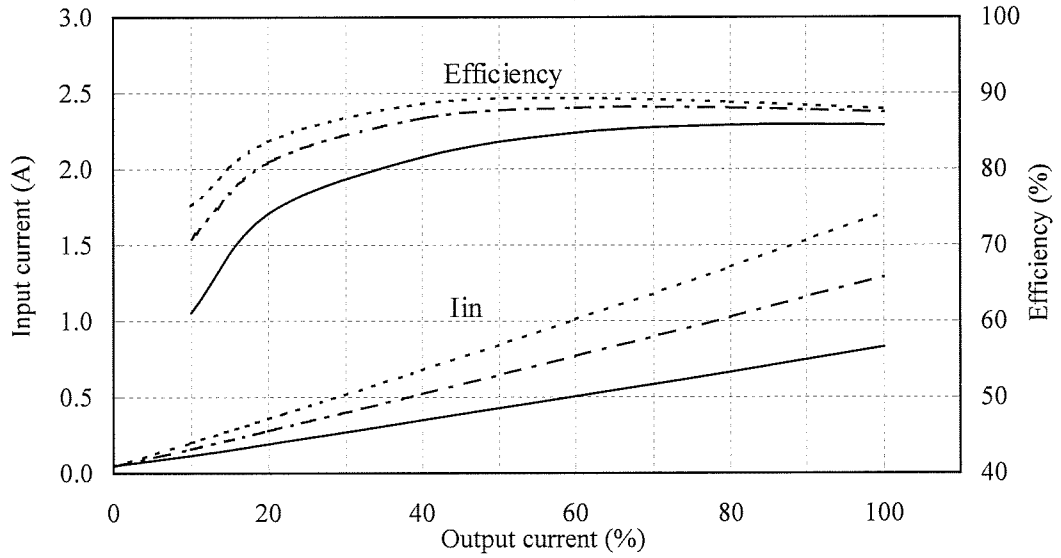


2.1 (3) 効率、入力電流対出力電流

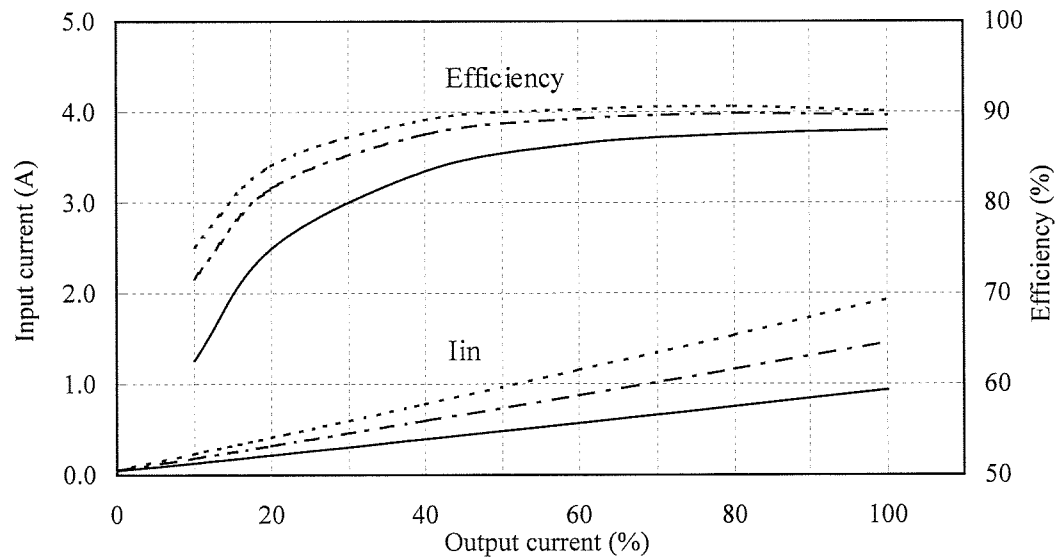
Efficiency and input current vs output current

Conditions V_{in} : 36 VDC -----
 : 48 VDC - - - - -
 : 76 VDC ————
 T_a : 25 °C
 Air Velocity : 2m/s

1.8V



2.5V

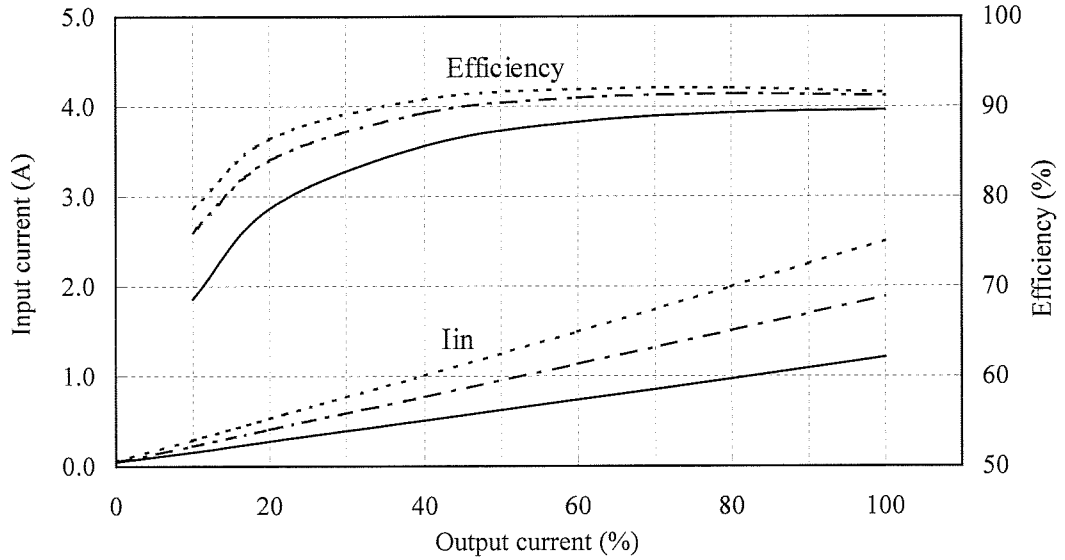


2.1 (3) 効率、入力電流対出力電流

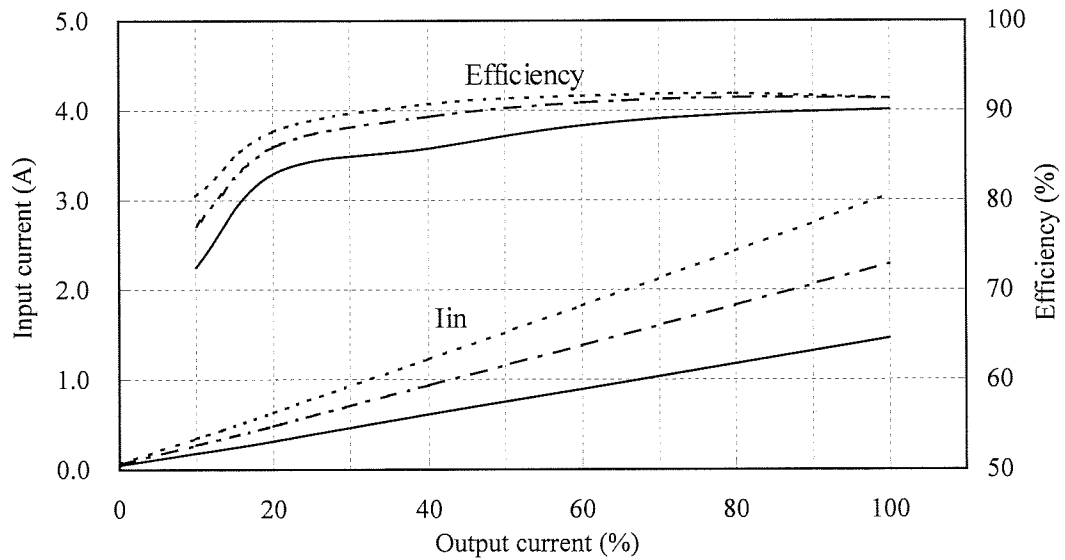
Efficiency and input current vs output current

Conditions V_{in} : 36 VDC -----
 : 48 VDC - - - - -
 : 76 VDC ————
 T_a : 25 °C
 Air Velocity : 2m/s

3.3V



5V



2.1 (4) 効率対入力電圧
Efficiency vs input voltage

Conditions Ta : 25 °C

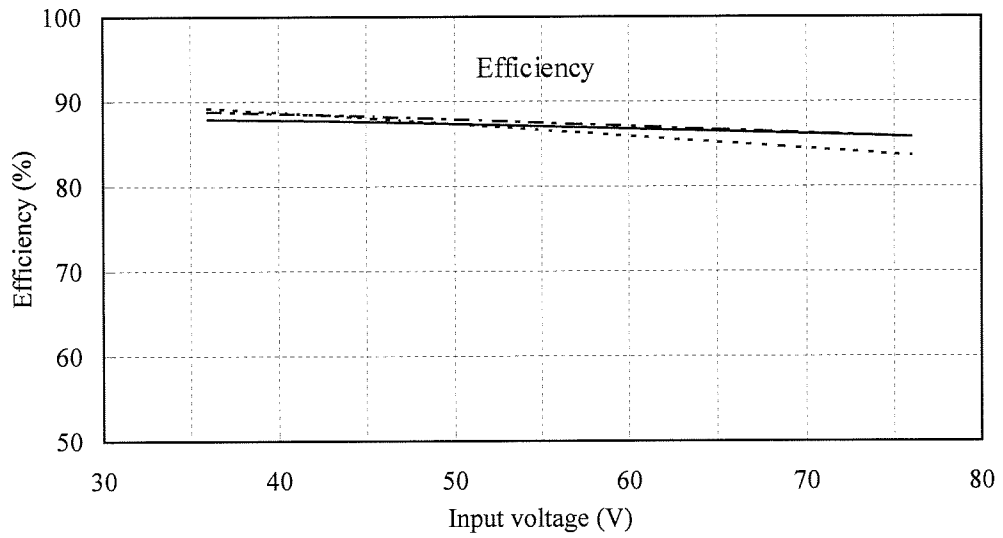
Iout : 50 % -----

80 % - - - - -

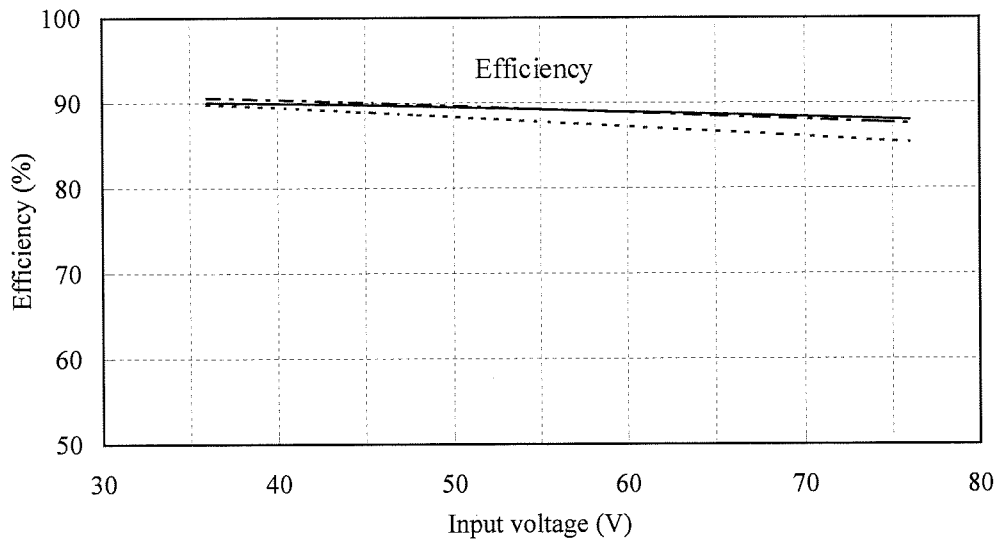
100 % _____

Air Velocity : 2m/s

1.8V



2.5V



2.1 (4) 効率対入力電圧
Efficiency vs input voltage

Conditions Ta : 25 °C

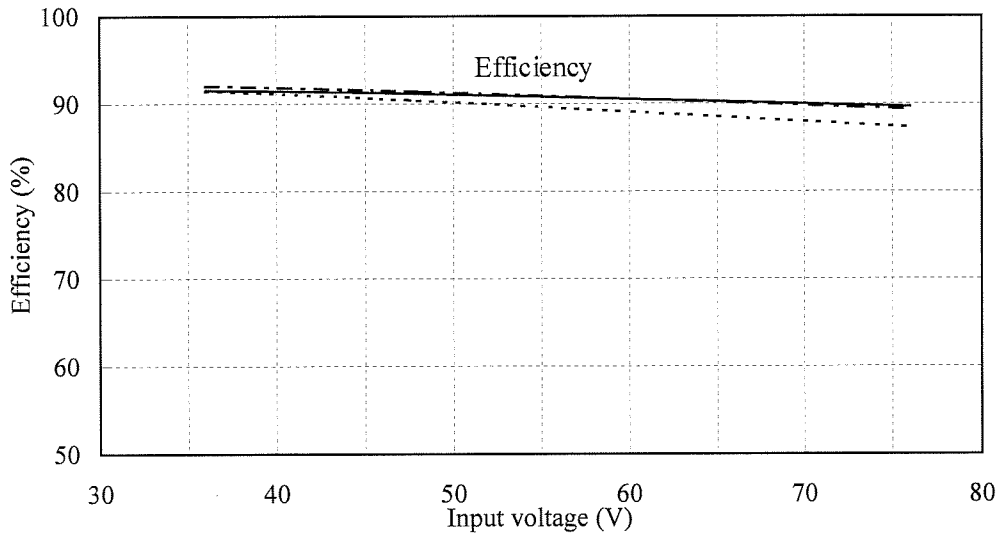
Iout : 50 % -----

80 % - - - - -

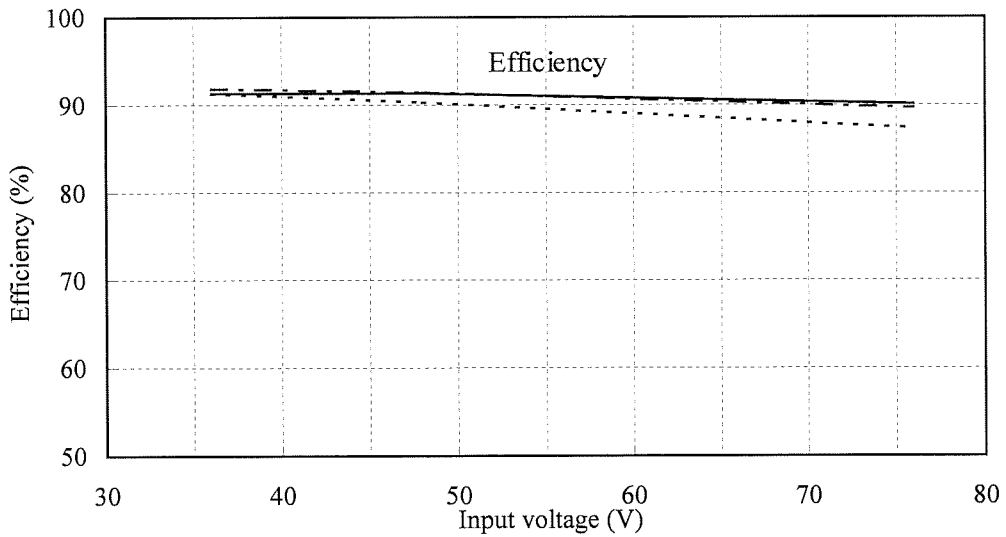
100 % _____

Air Velocity : 2m/s

3.3V



5V



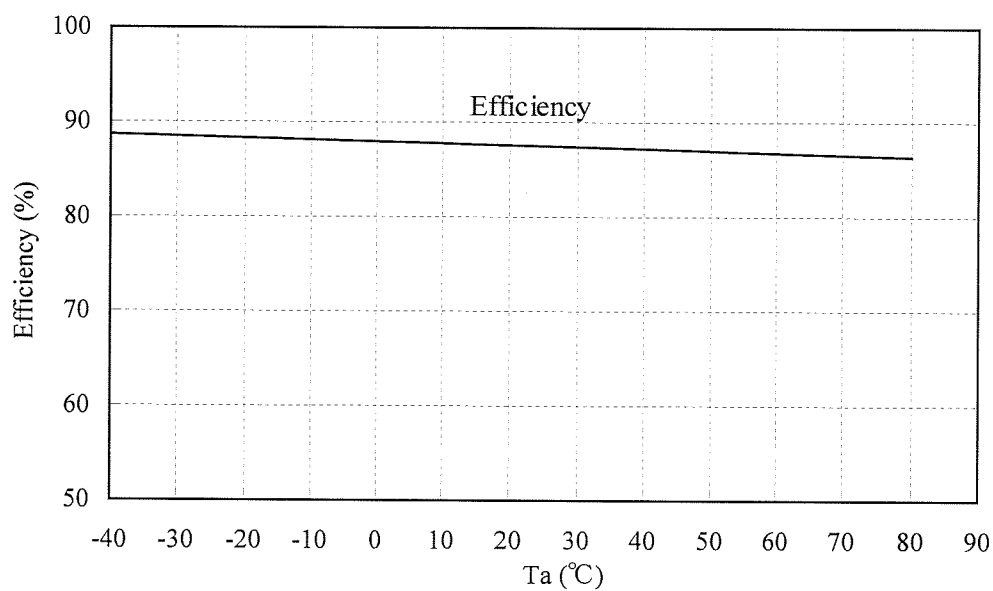
2.1 (5) 効率対周囲温度
Efficiency vs ambient temperature

Conditions Vin : 48 VDC

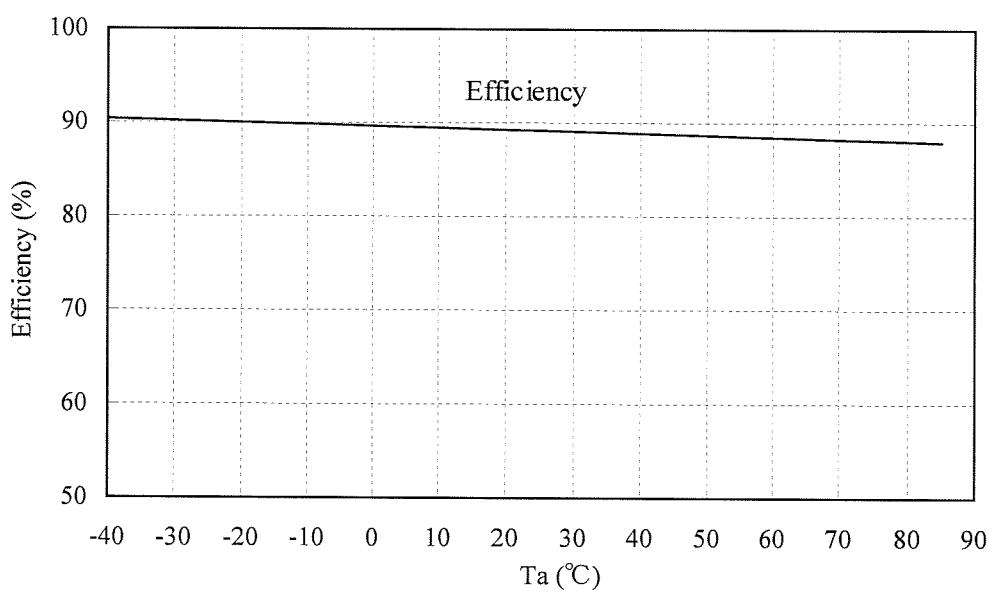
Iout : 100 %

Air Velocity : 2m/s

1.8V



2.5V



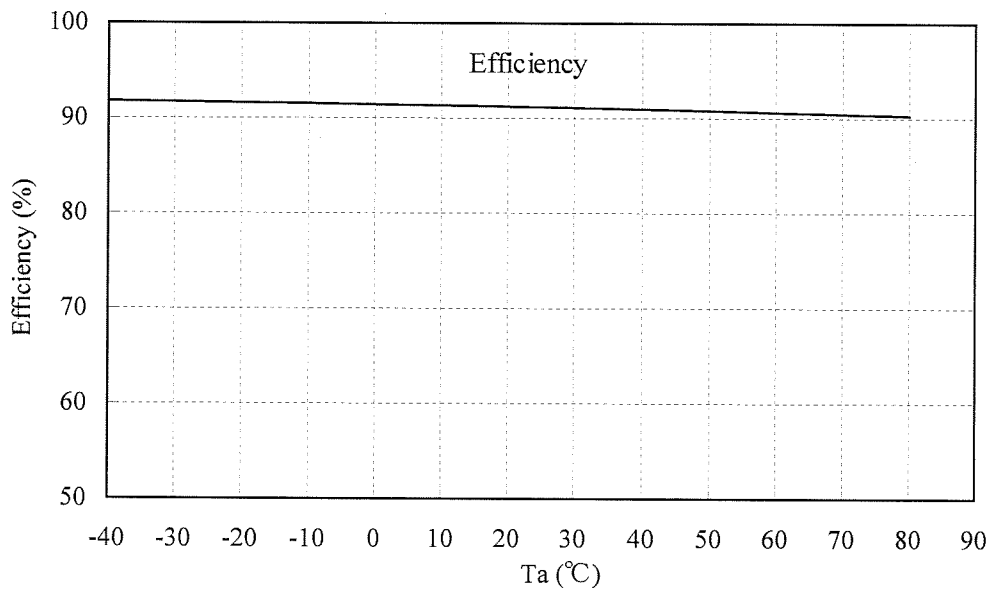
2.1 (5) 効率対周囲温度
Efficiency vs ambient temperature

Conditions V_{in} : 48 VDC

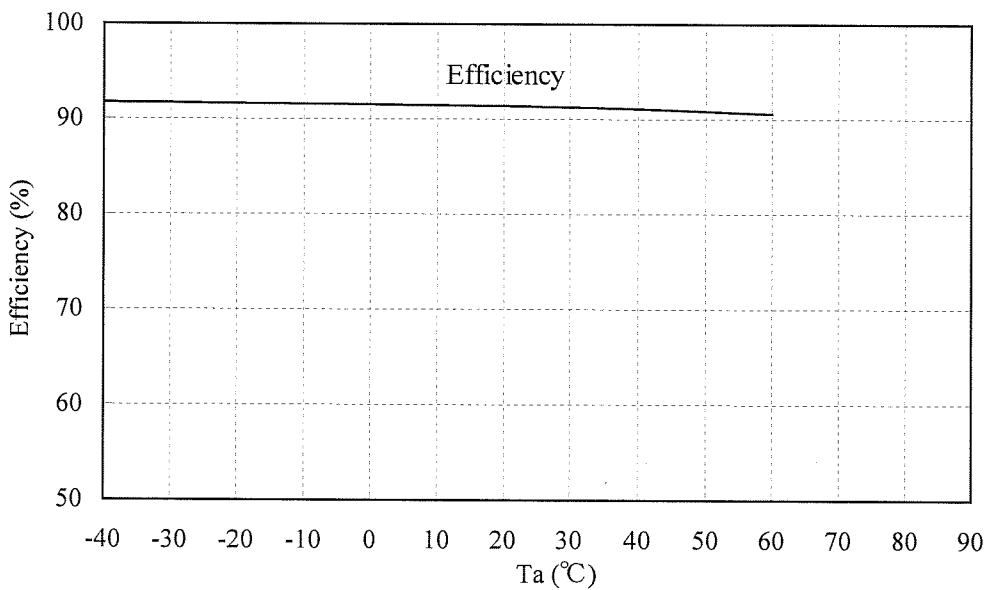
I_{out} : 100 %

Air Velocity : 2m/s

3.3V



5V



2.2 通電ドリフト特性

Warm up voltage drift characteristics

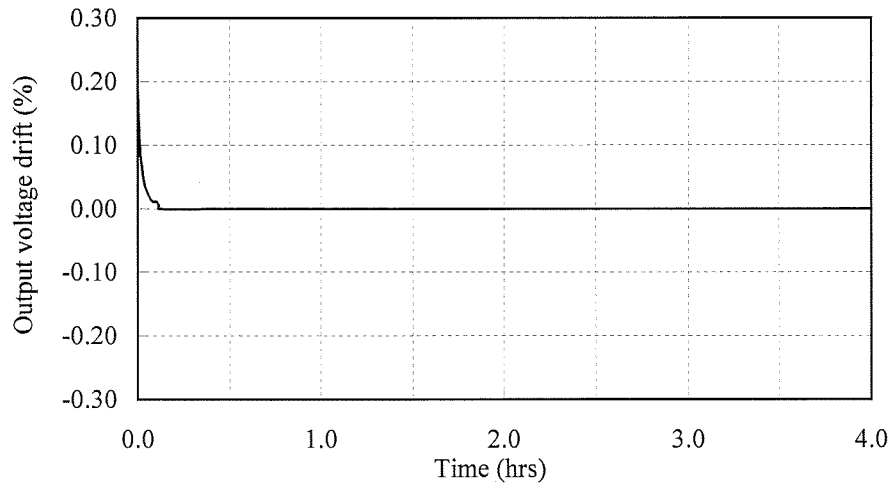
Conditions Vin : 48 VDC

Iout : 100 %

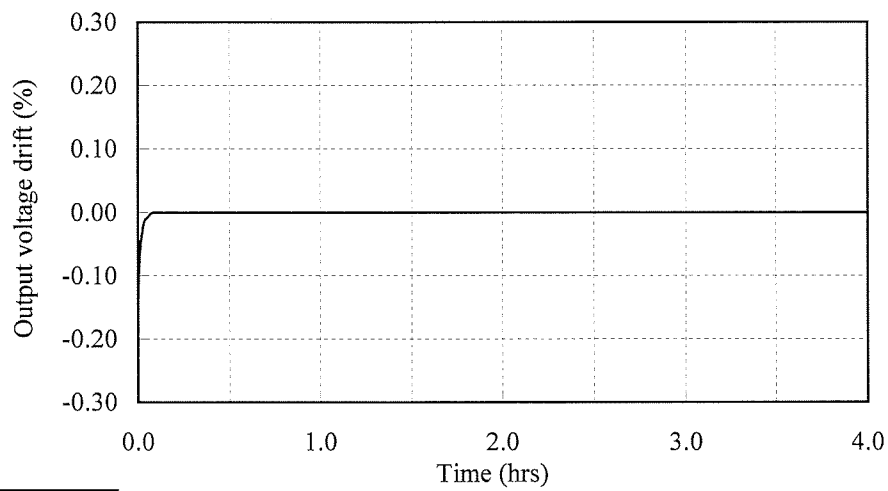
Ta : 25 °C

Air Velocity : 2 m/s

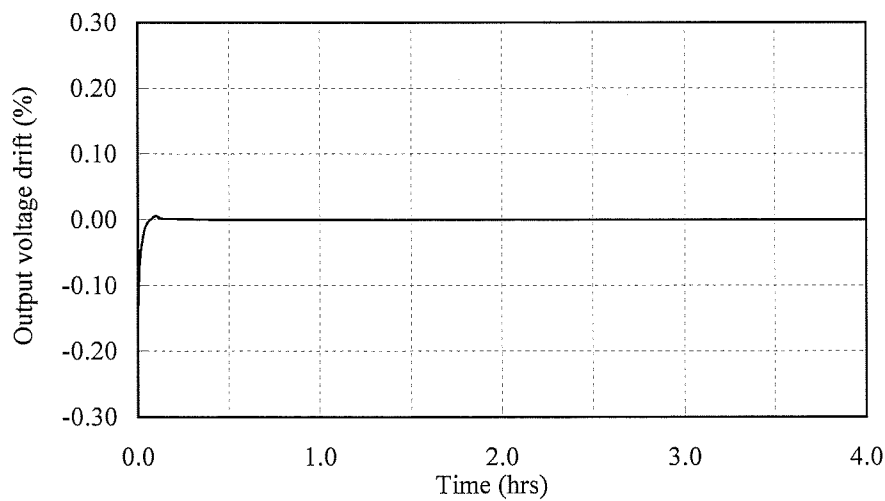
1.8V



3.3V



5V

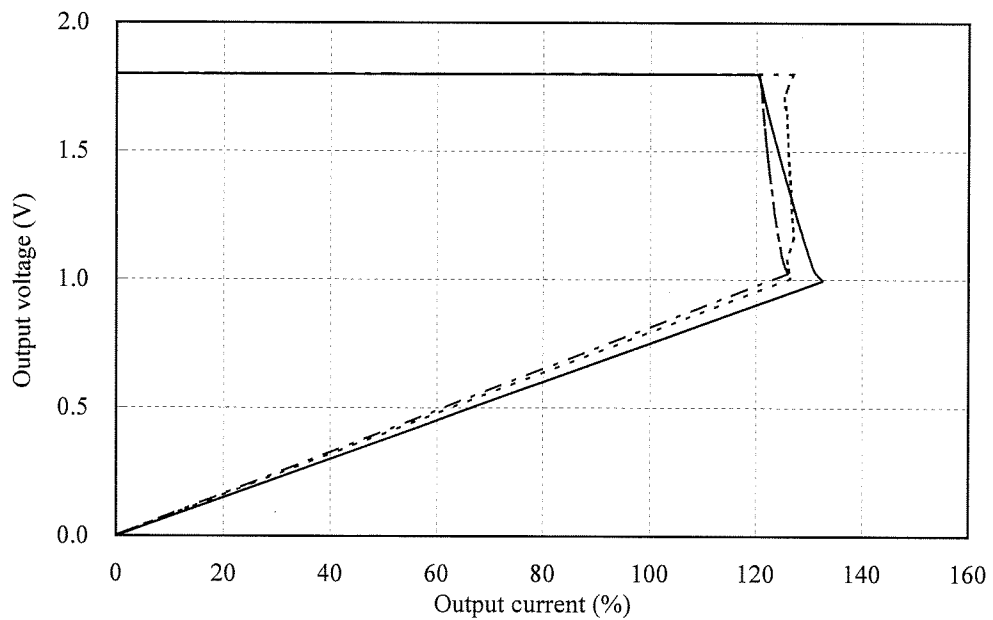


2.3 過電流保護特性

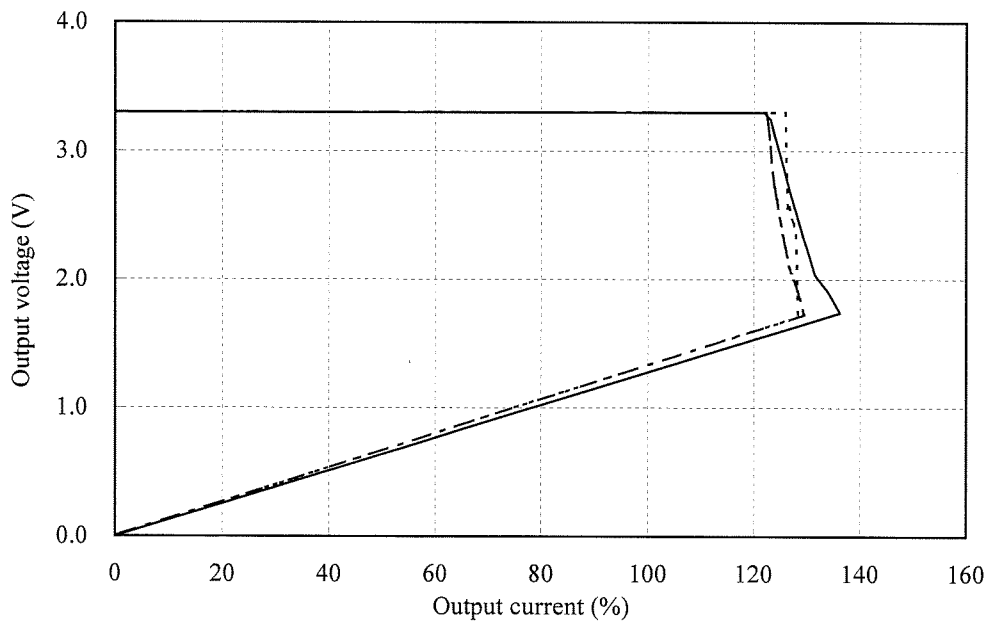
Over current protection (OCP) characteristics

Conditions Vin : 36 VDC -----
 : 48 VDC - - - - -
 : 76 VDC _____
 Ta : 25 °C

1.8V



3.3V



* OCP状態になり、出力電圧がLVPレベルより低下するとラッチ遮断します。
 (/Vタイプを除きます。)

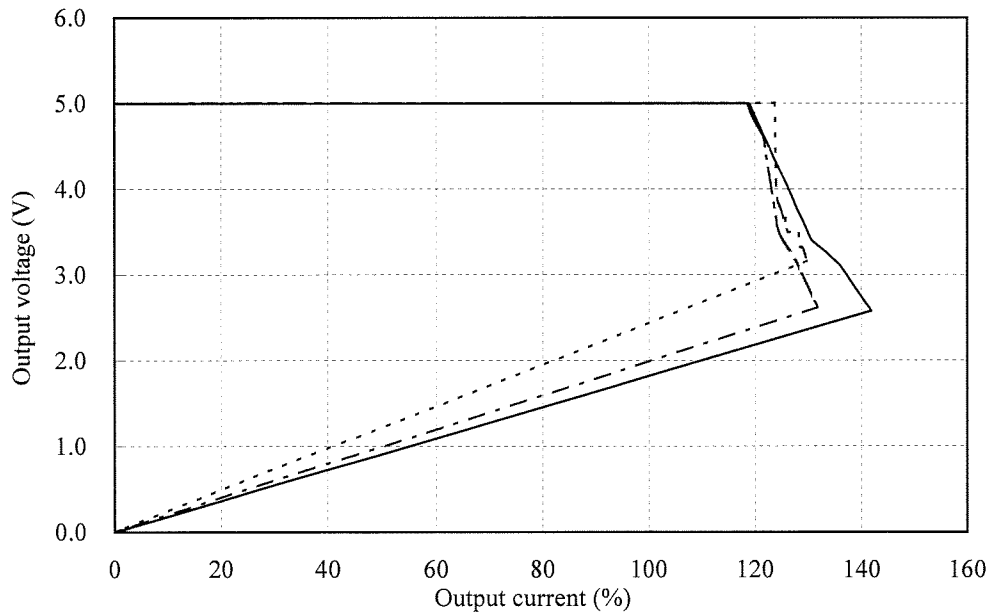
When left in OCP condition, output voltage drops below LVP level
 and output will shutdown with latch. (Except /V type)

2.3 過電流保護特性

Over current protection (OCP) characteristics

Conditions Vin : 36 VDC -----
 : 48 VDC - - - - -
 : 76 VDC ————
 Ta : 25 °C

5V



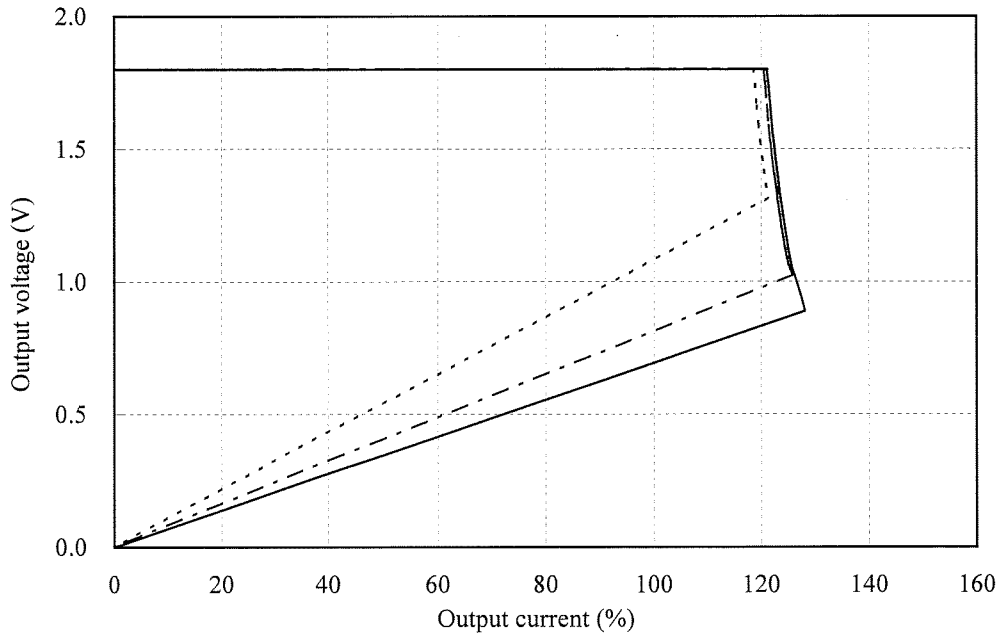
* OCP状態になり、出力電圧がLVPレベルより低下するとラッチ遮断します。
 (/Vタイプを除きます。)

When left in OCP condition, output voltage drops below LVP level
 and output will shutdown with latch.(Except /V type)

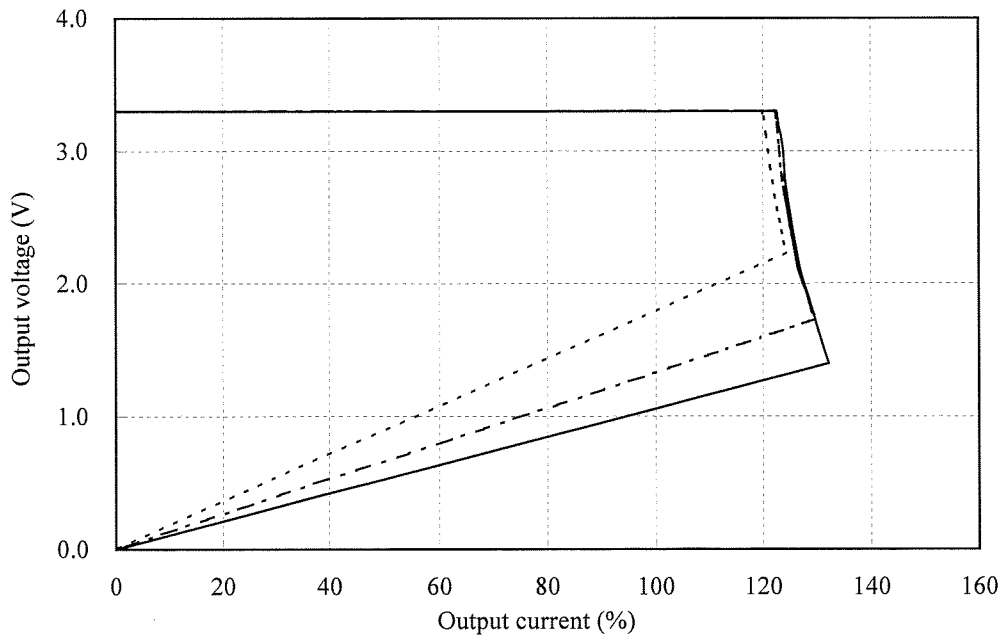
2.3 過電流保護特性
Over current protection (OCP) characteristics

Conditions Ta : -40 °C -----
 : 25 °C - - - - -
 : 80 °C _____
 Vin : 48 VDC

1.8V



3.3V

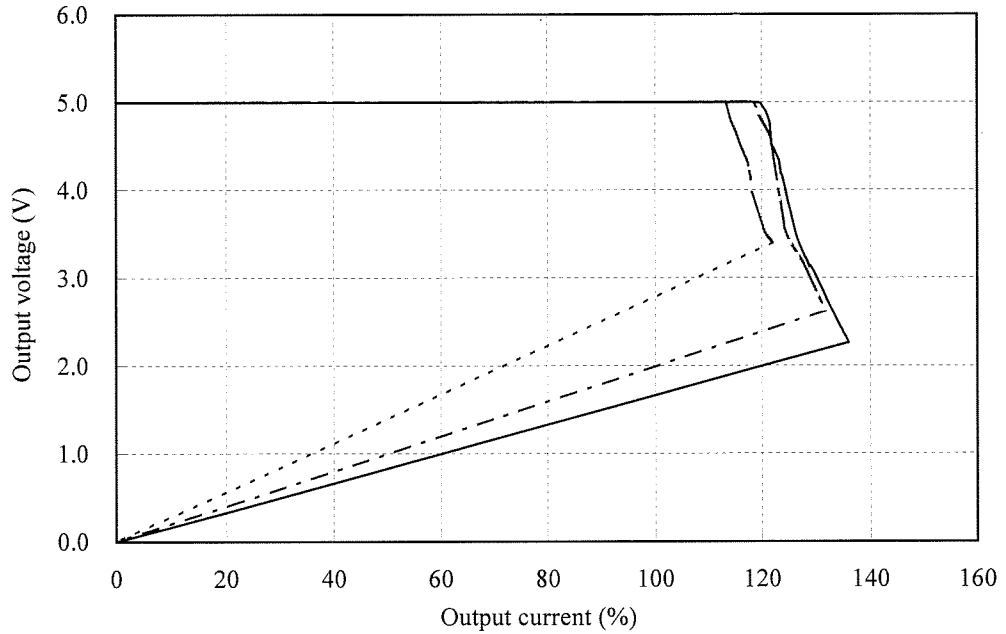


* OCP状態になり、出力電圧がLVPレベルより低下するとラッチ遮断します。
 (/Vタイプを除きます。)
 When left in OCP condition, output voltage drops below LVP level
 and output will shutdown with latch. (Except /V type)

2.3 過電流保護特性
Over current protection (OCP) characteristics

Conditions Ta : -40 °C -----
 : 25 °C - - - - -
 : 60 °C _____
 Vin : 48 VDC

5V

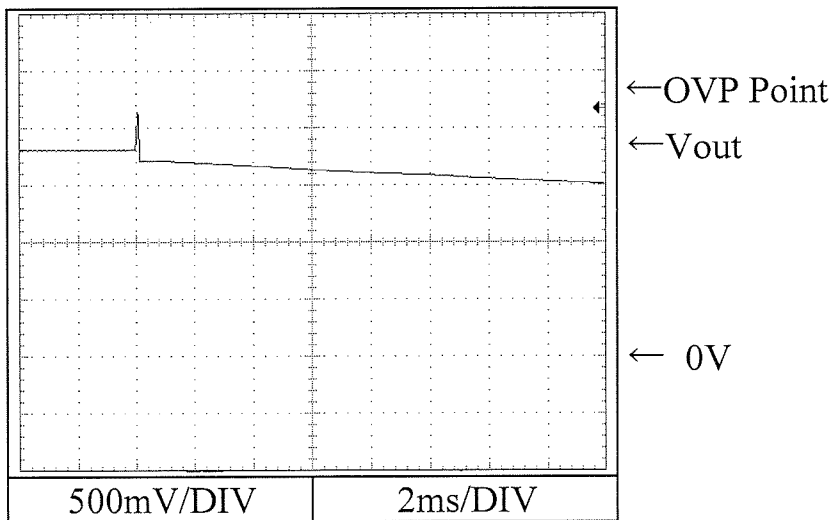


* OCP状態になり、出力電圧がLVPレベルより低下するとラッチ遮断します。
 (Vタイプを除きます。)
 When left in OCP condition, output voltage drops below LVP level
 and output will shutdown with latch. (Except /V type)

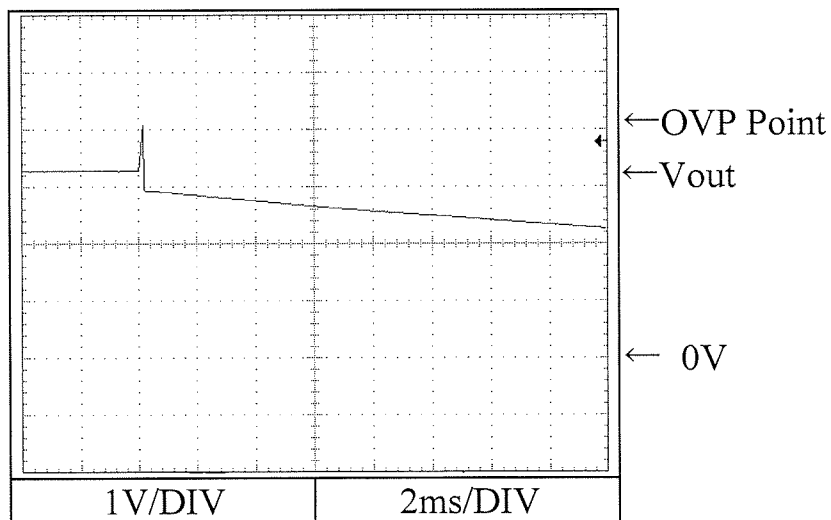
2.4 過電圧保護特性
Over voltage protection (OVP) characteristics

Conditions Vin : 48 VDC
Iout : 0 %
Ta : 25 °C

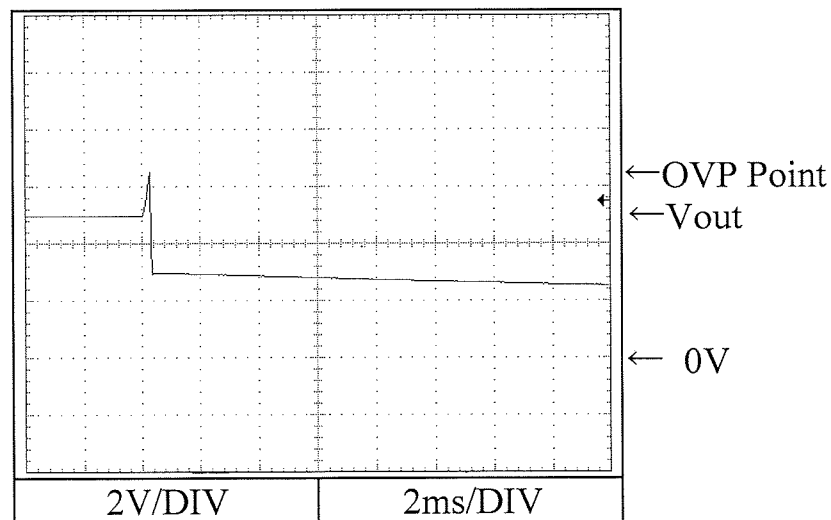
1.8V



3.3V



5V

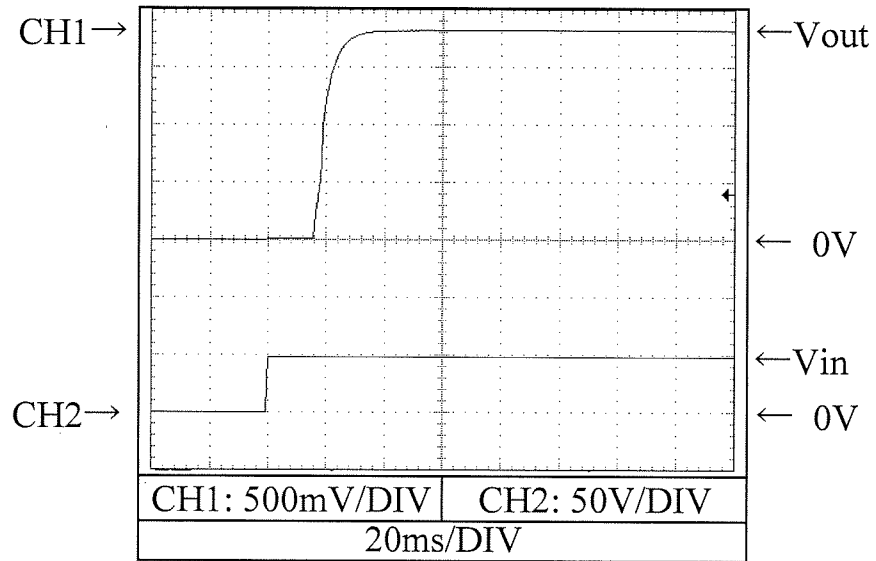


2.5 出力立ち上がり特性
Output rise characteristics

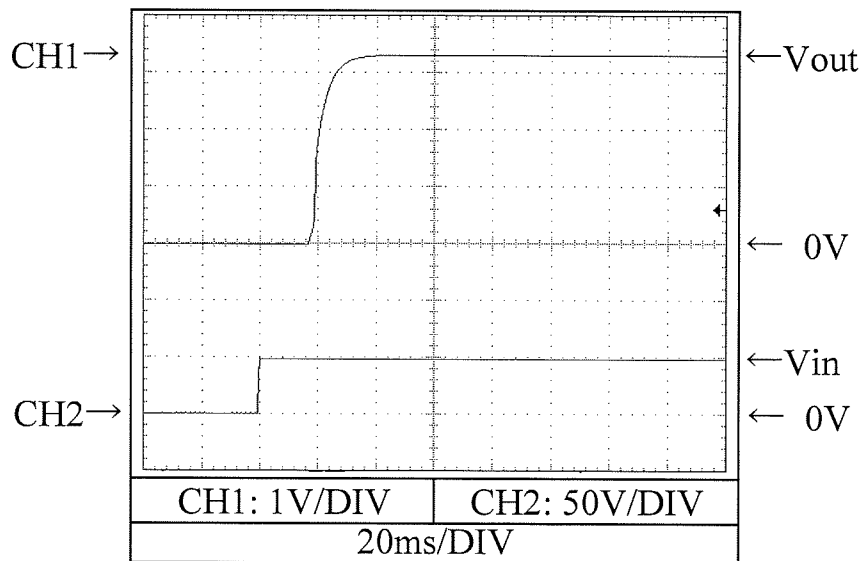
PAE100S48-*

Conditions Vin : 48 VDC
Iout : 0 %
Ta : 25 °C

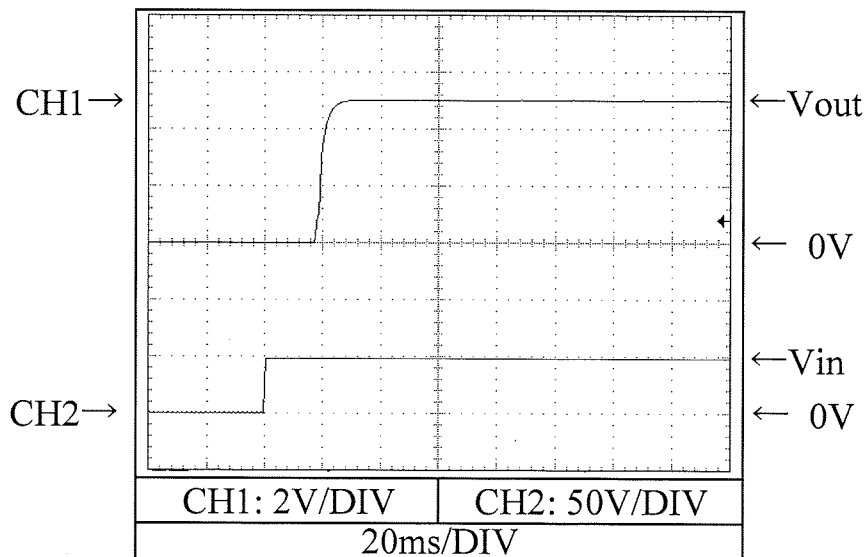
1.8V



3.3V



5V

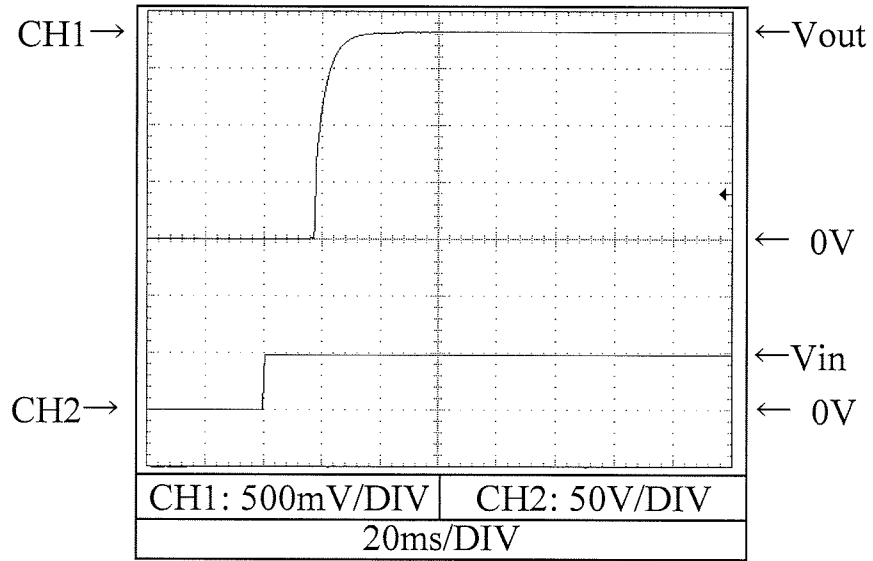


出力立ち上がり特性
Output rise characteristics

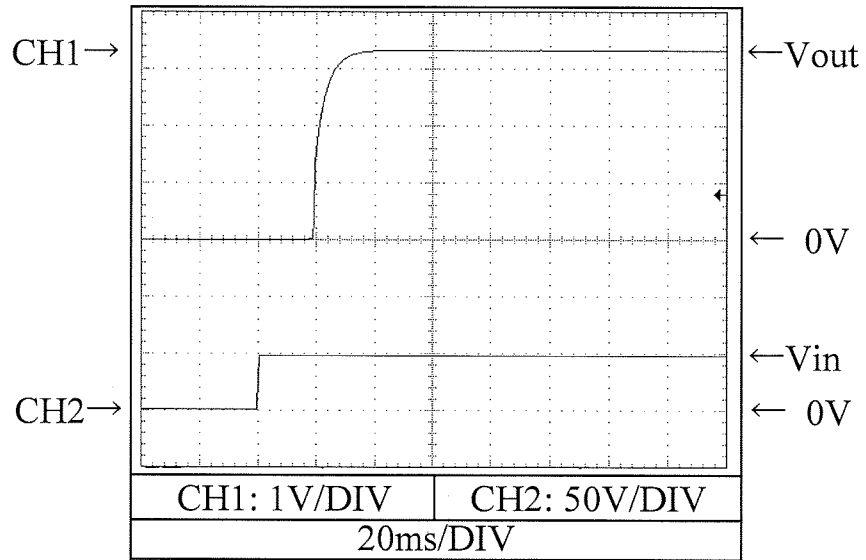
PAE100S48-*

Conditions Vin : 48 VDC
Iout : 100 %
Ta : 25 °C

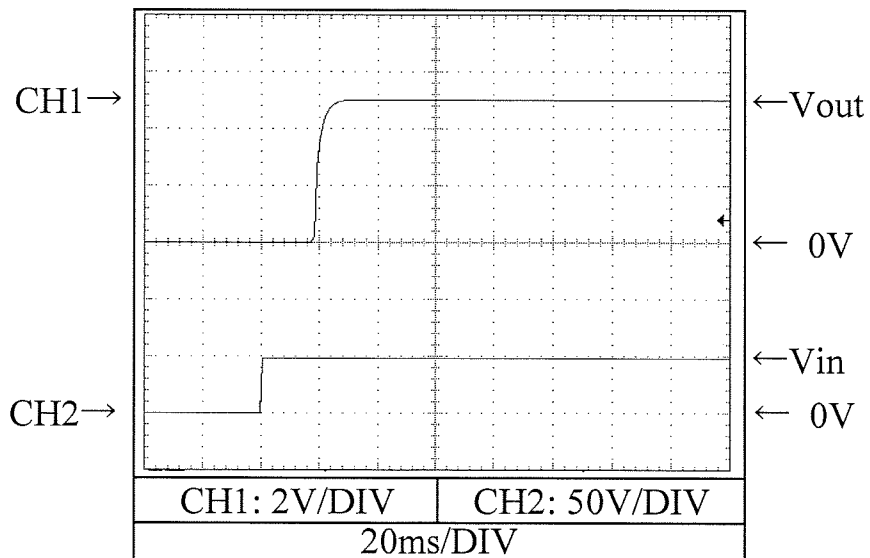
1.8V



3.3V



5V

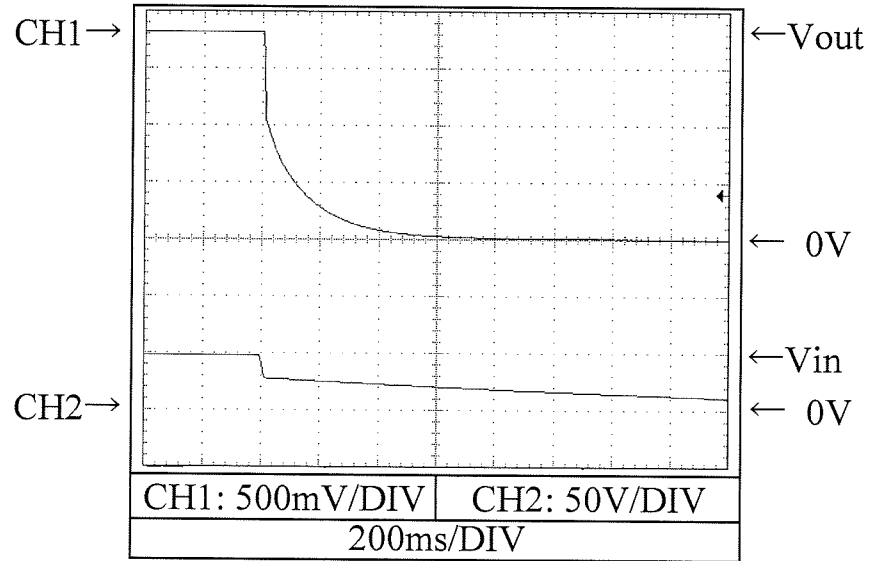


2.6 出力立ち下がり特性
Output fall characteristics

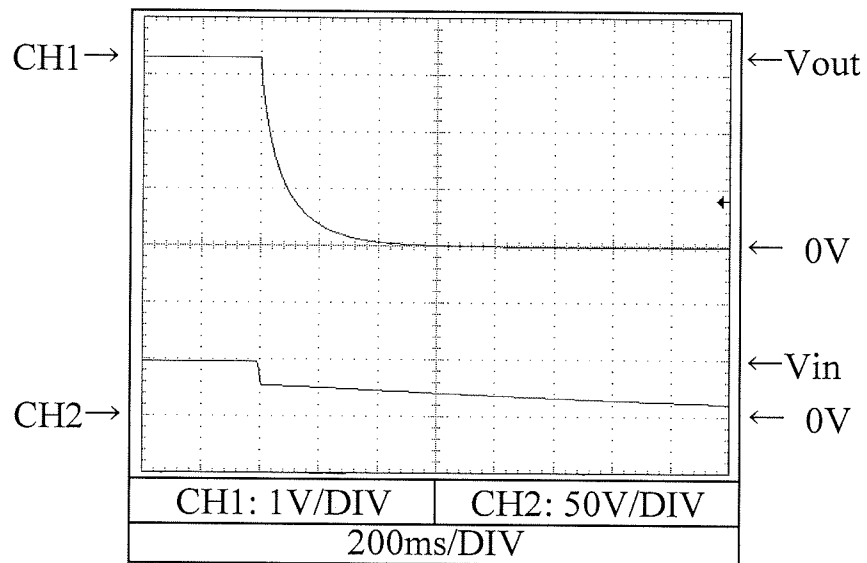
PAE100S48-*

Conditions Vin : 48 VDC
Iout : 0 %
Ta : 25 °C

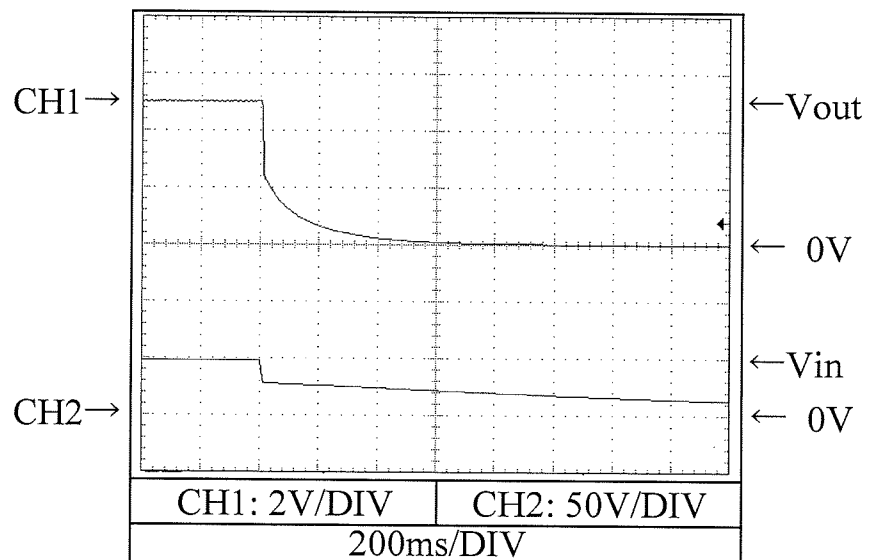
1.8V



3.3V



5V

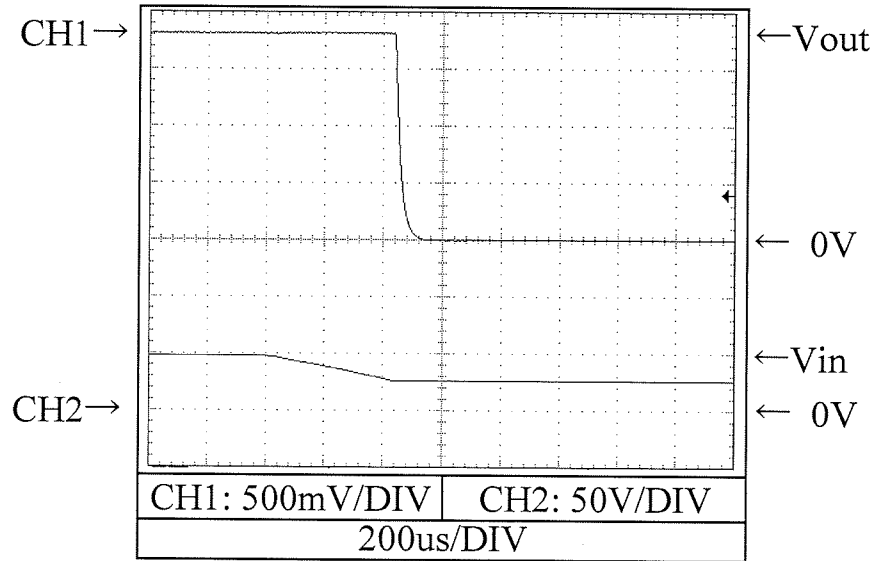


出力立ち下がり特性
Output rise characteristics

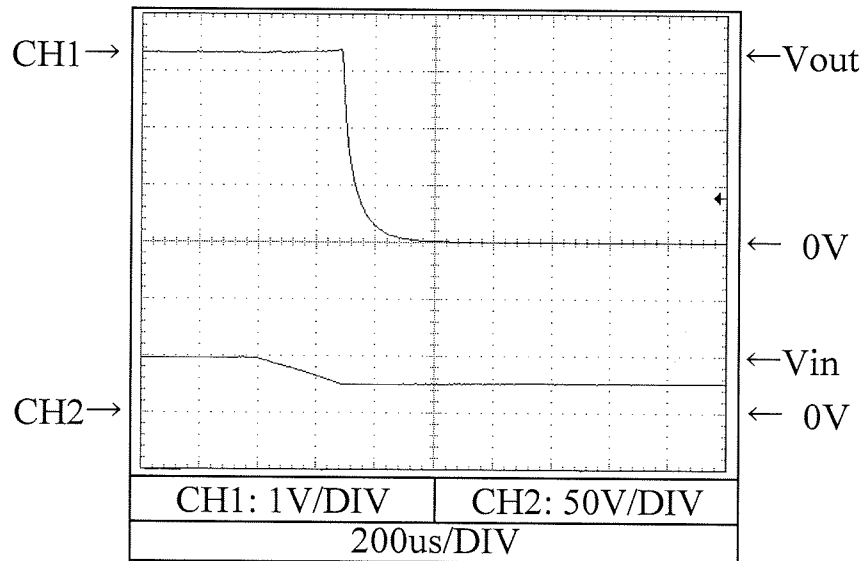
PAE100S48-*

Conditions Vin : 48 VDC
Iout : 100 %
Ta : 25 °C

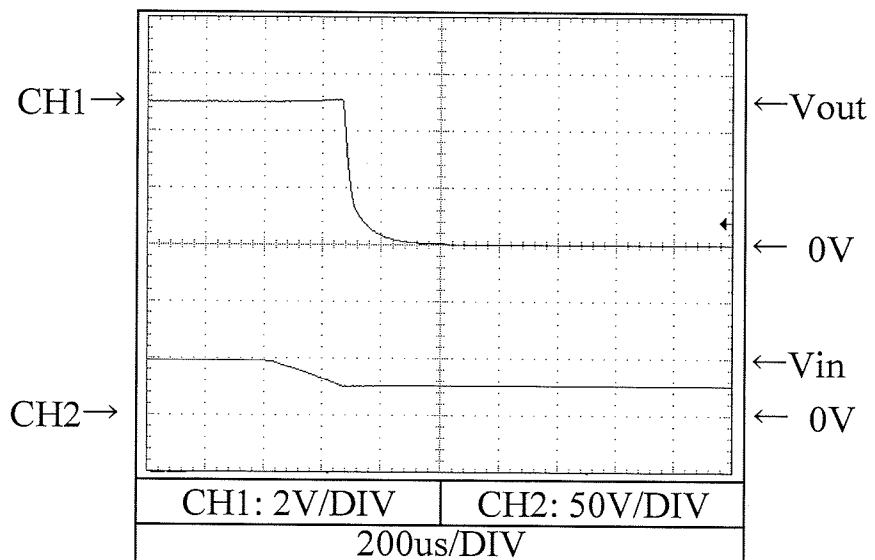
1.8V



3.3V



5V

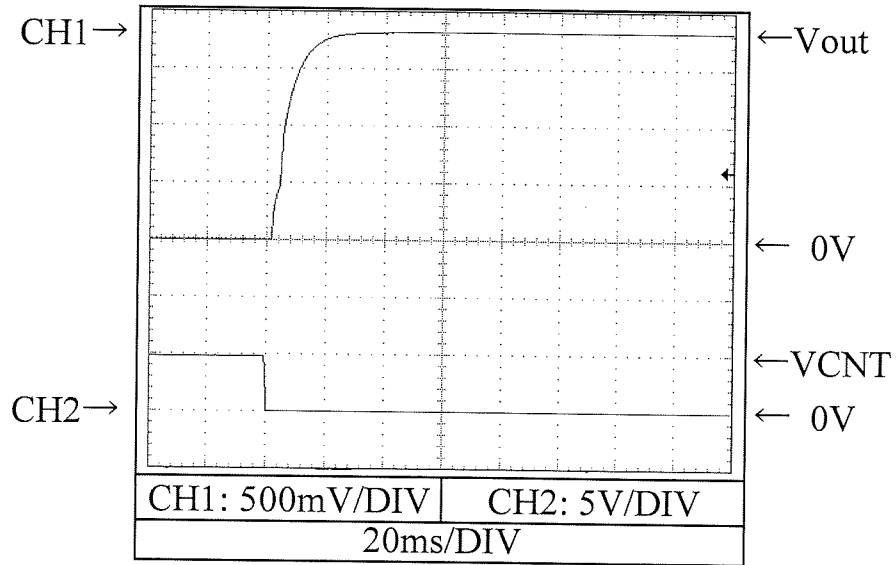


2.7 出力立ち上がり特性 (ON/OFFコントロール時)
Output rise characteristics with ON/OFF CONTROL

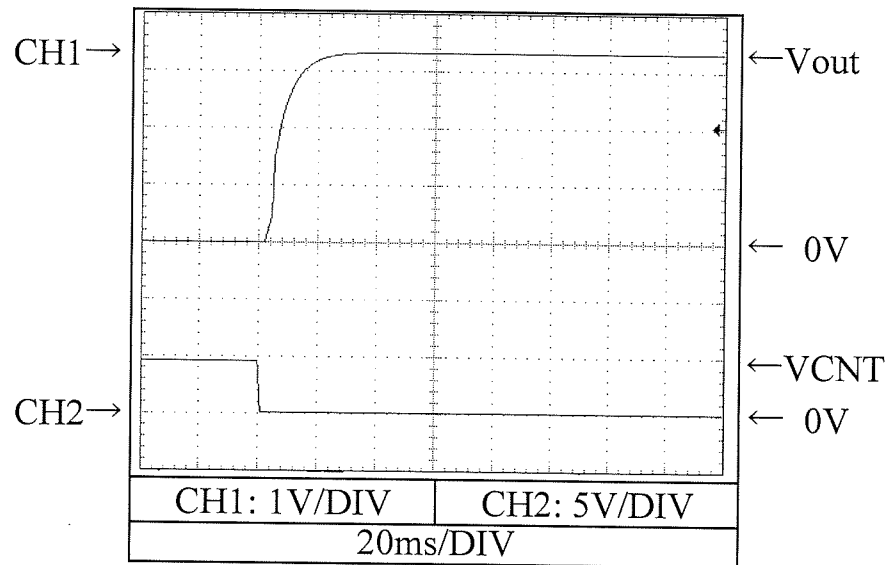
PAE100S48-*

Conditions Vin : 48 VDC
Iout : 0 %
Ta : 25 °C

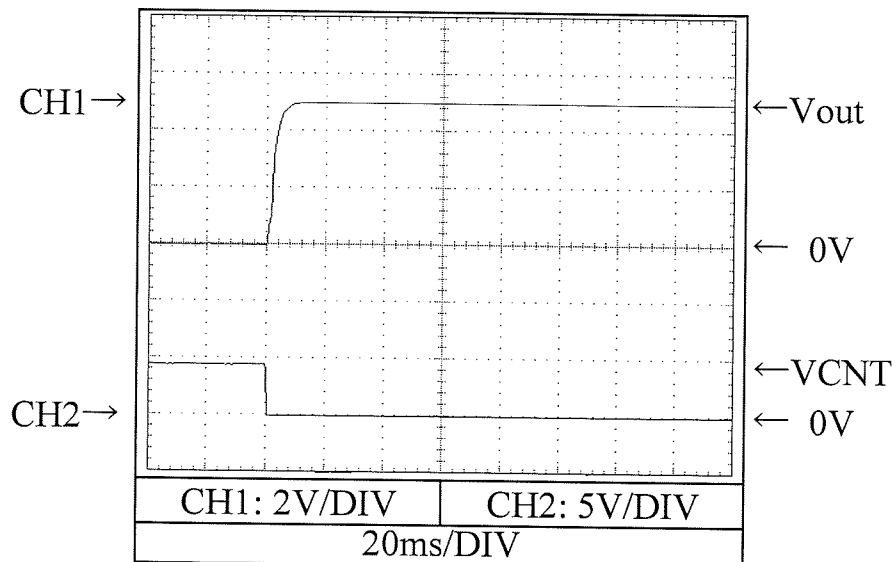
1.8V



3.3V



5V

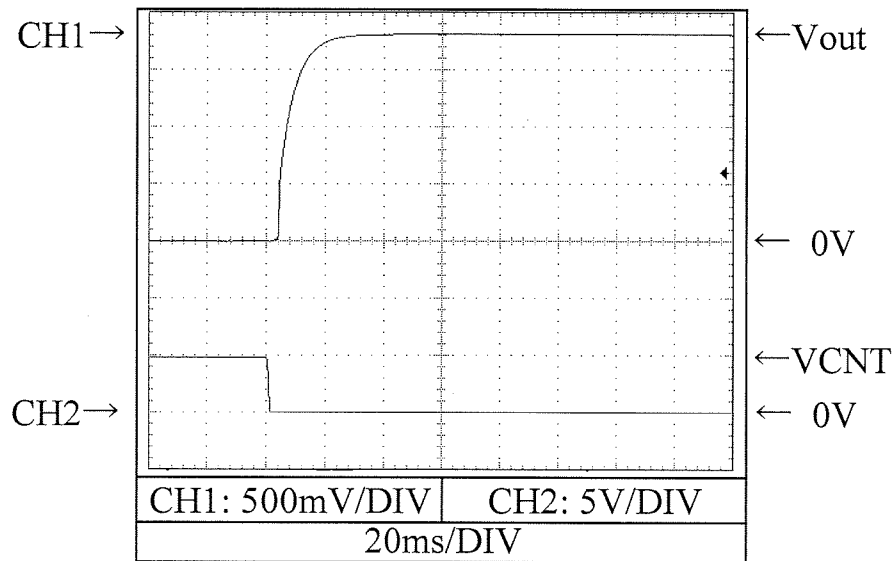


出力立ち上がり特性 (ON/OFFコントロール時)
Output rise characteristics with ON/OFF CONTROL

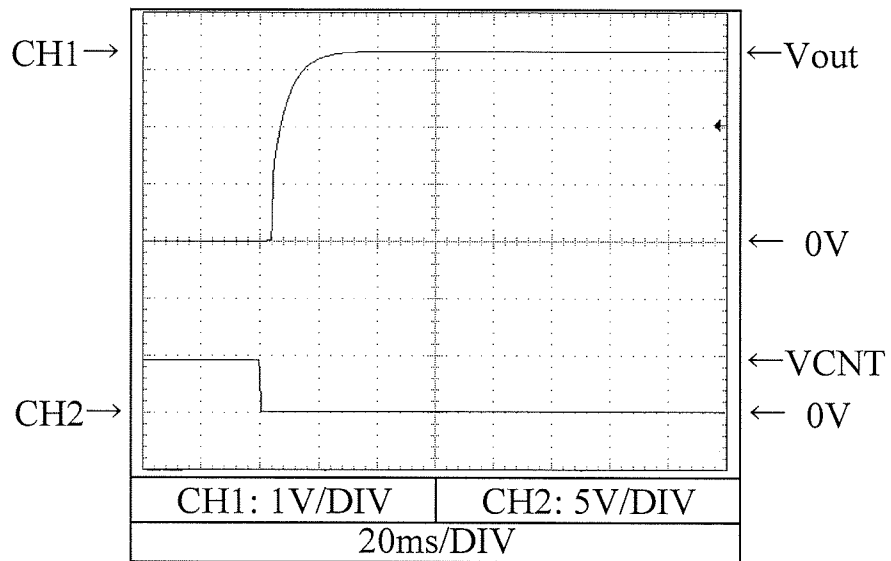
PAE100S48-*

Conditions Vin : 48 VDC
Iout : 100 %
Ta : 25 °C

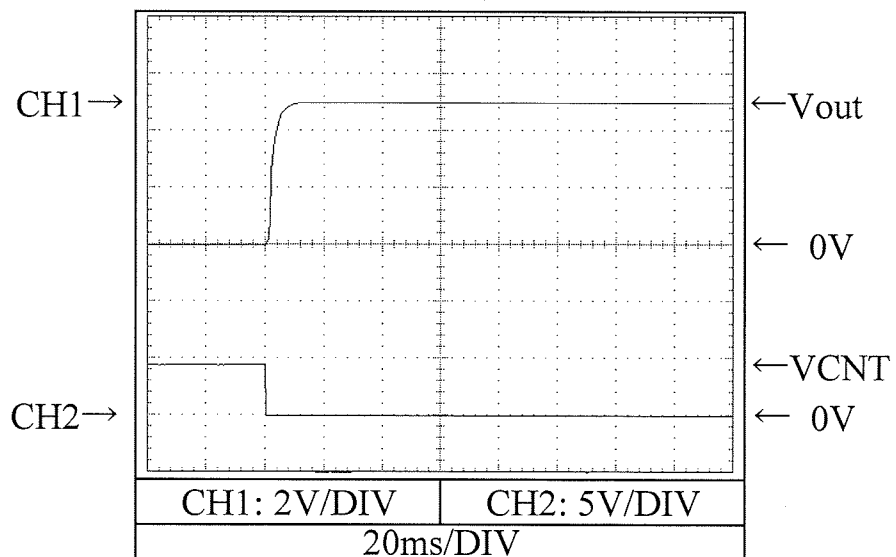
1.8V



3.3V



5V



2.8 出力立ち下がり特性 (ON/OFFコントロール時)
Output fall characteristics with ON/OFF CONTROL

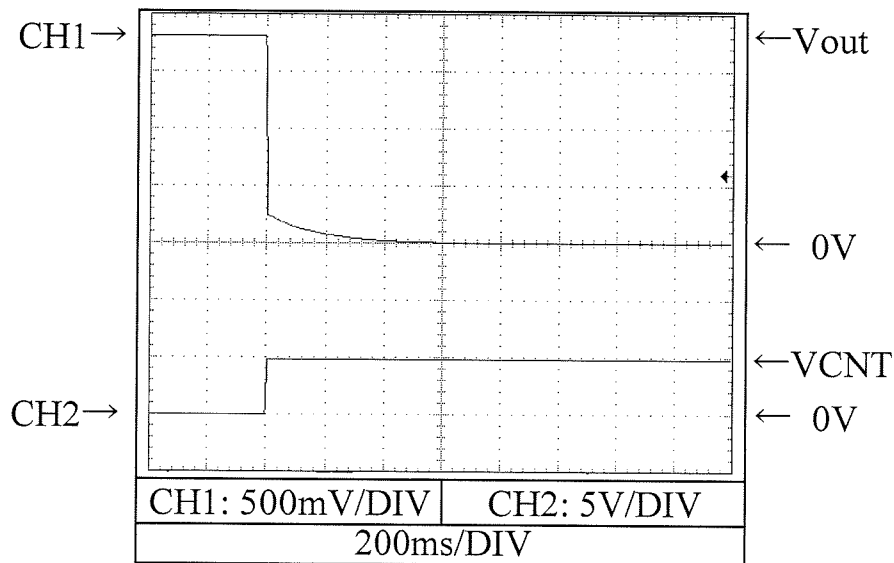
PAE100S48-*

Conditions Vin : 48 VDC

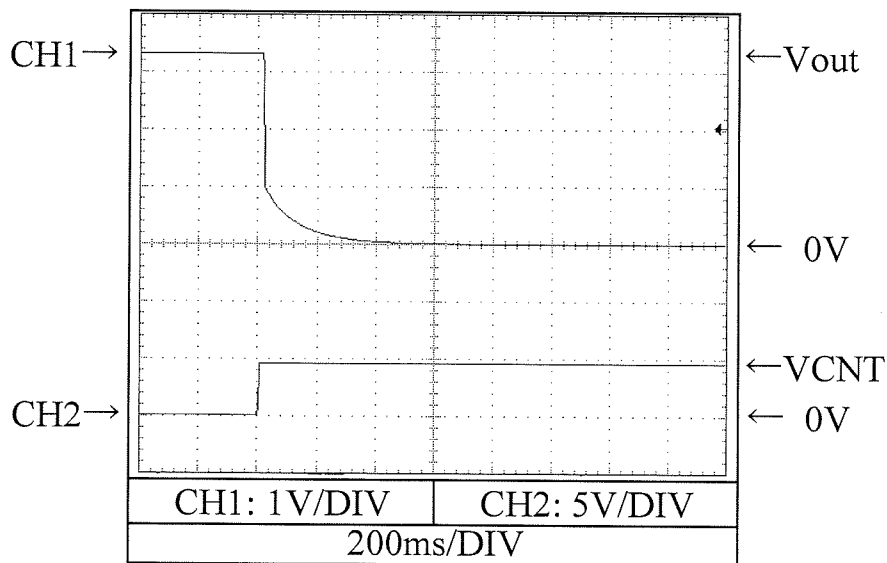
Iout : 0 %

Ta : 25 °C

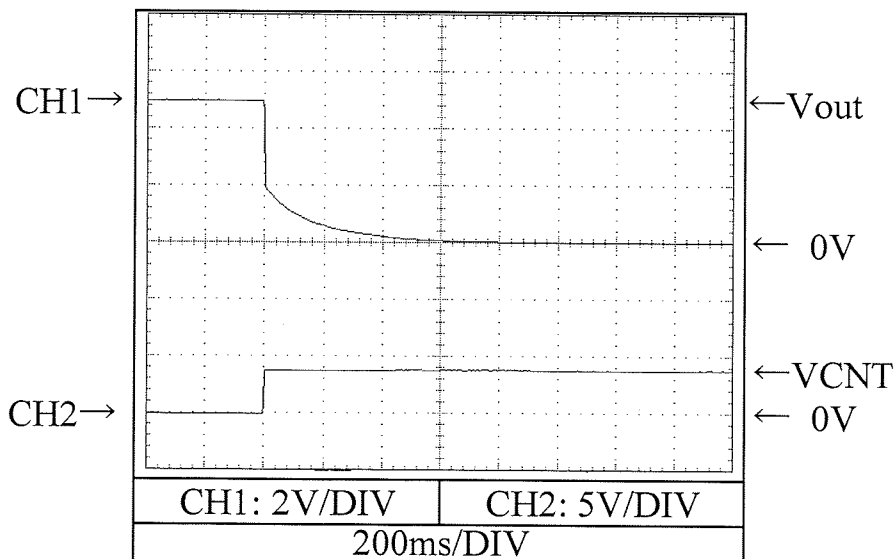
1.8V



3.3V



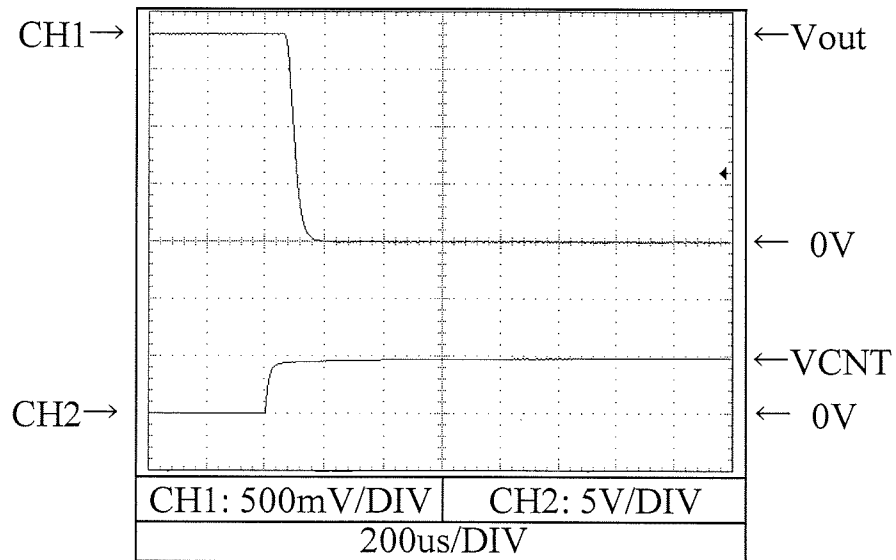
5V



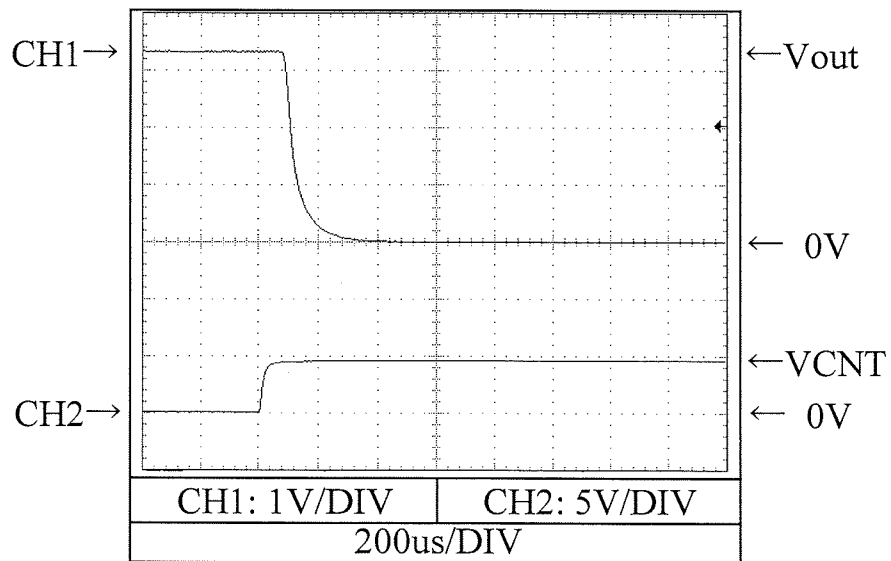
出力立ち下がり特性 (ON/OFFコントロール時)
Output fall characteristics with ON/OFF CONTROL

Conditions Vin : 48 VDC
Iout : 100 %
Ta : 25 °C

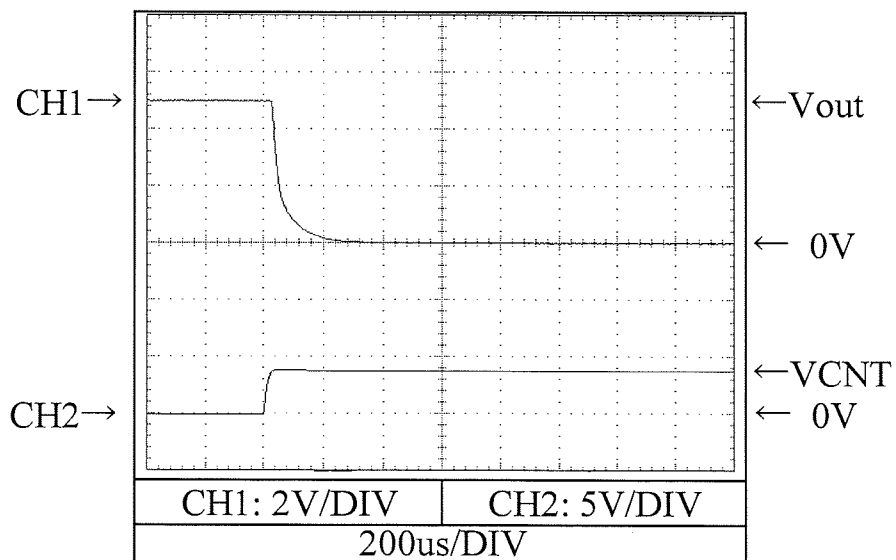
1.8V



3.3V

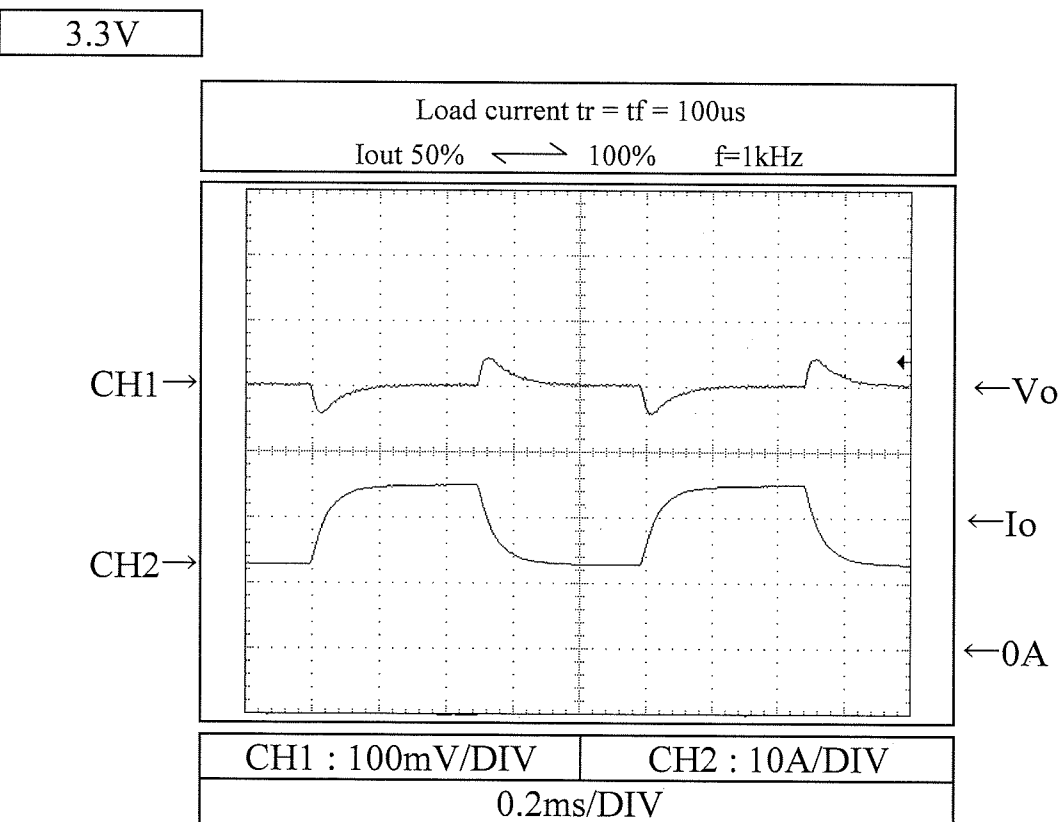
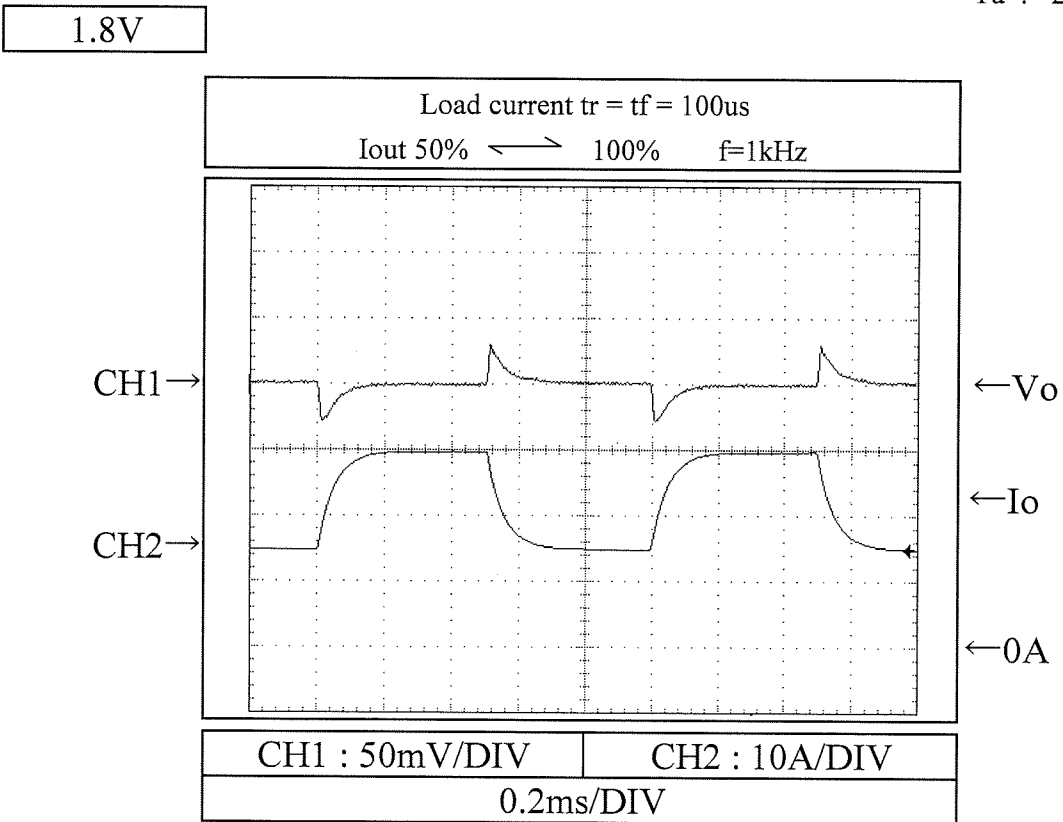


5V



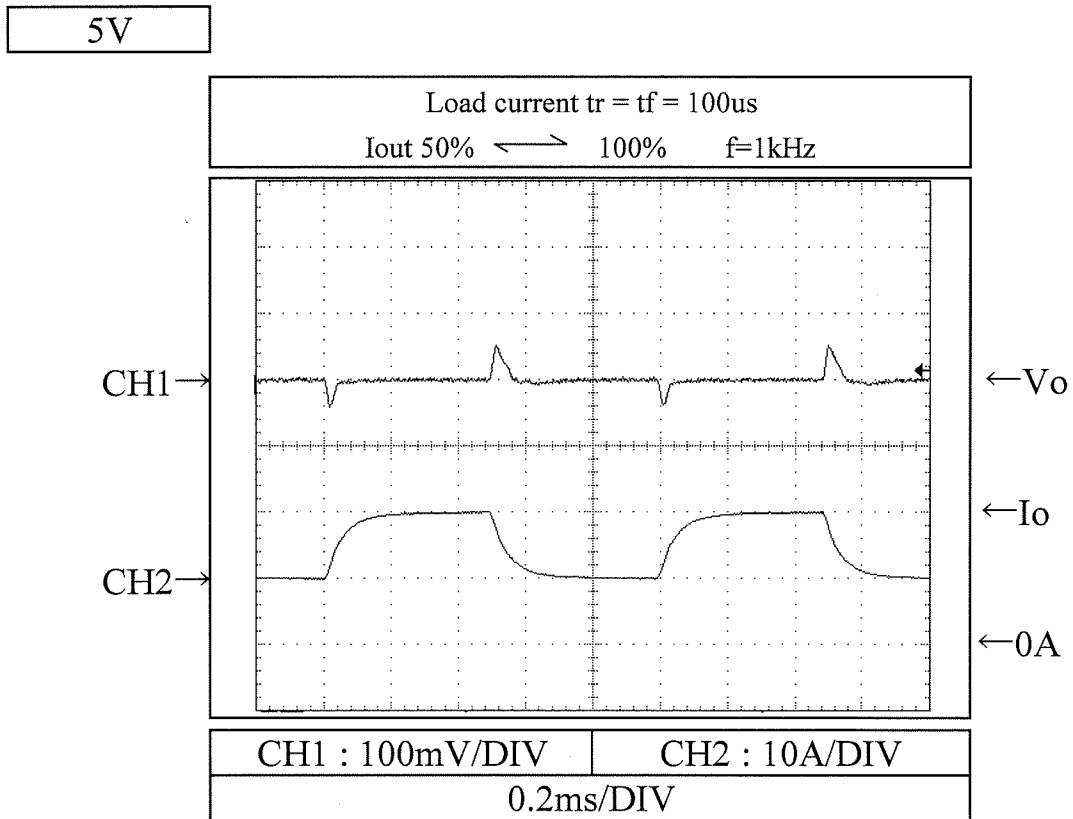
2.9 過渡応答 (負荷急変) 特性
 Dynamic load response characteristics

Conditions V_{in} : 48 VDC
 T_a : 25 °C



2.9 過渡応答（負荷急変）特性
Dynamic load response characteristics

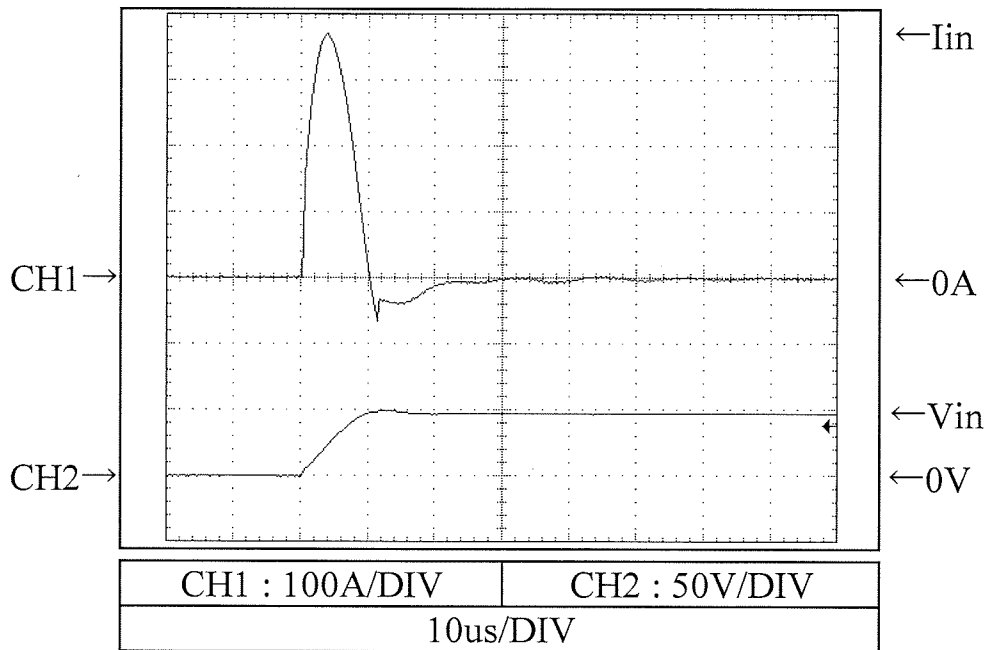
Conditions V_{in} : 48 VDC
 T_a : 25 °C



2.10 入力サージ電流（突入電流）特性
Inrush current waveform

Conditions Vin : 48 VDC
Iout : 100 %
Ta : 25 °C

5V



2.11 出力リップル、ノイズ波形
Output ripple and noise waveform

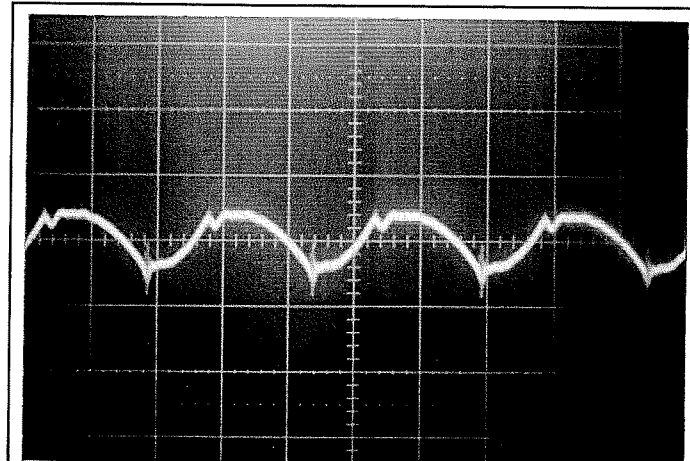
PAE100S48-*

Conditions V_{in} : 48 VDC

I_{out} : 100 %

T_a : 25 °C

1.8V

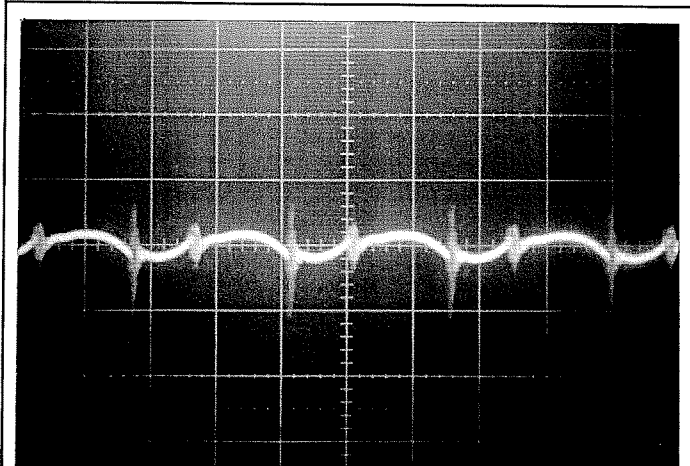


20mV/DIV

1 μ s/DIV

28mV

3.3V

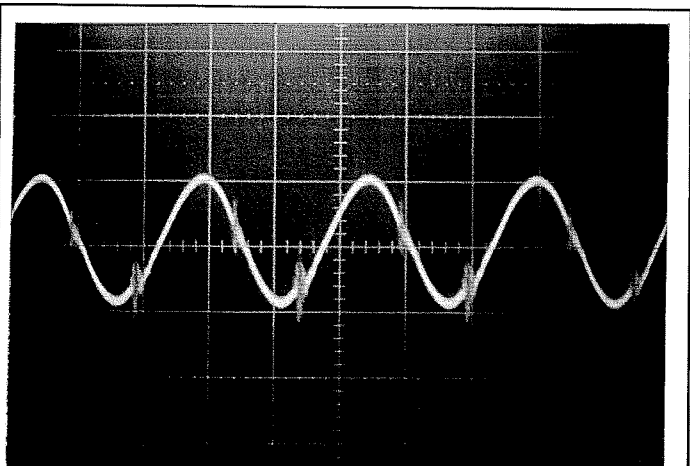


20mV/DIV

1 μ s/DIV

35mV

5V



20mV/DIV

1 μ s/DIV

45mV

2.12 EMI特性

Electro-Magnetic Interference characteristics

(a) 雑音端子電圧 (帰還ノイズ)

Conducted Emission

(1) VCCI class A 対応アプリケーションシステム

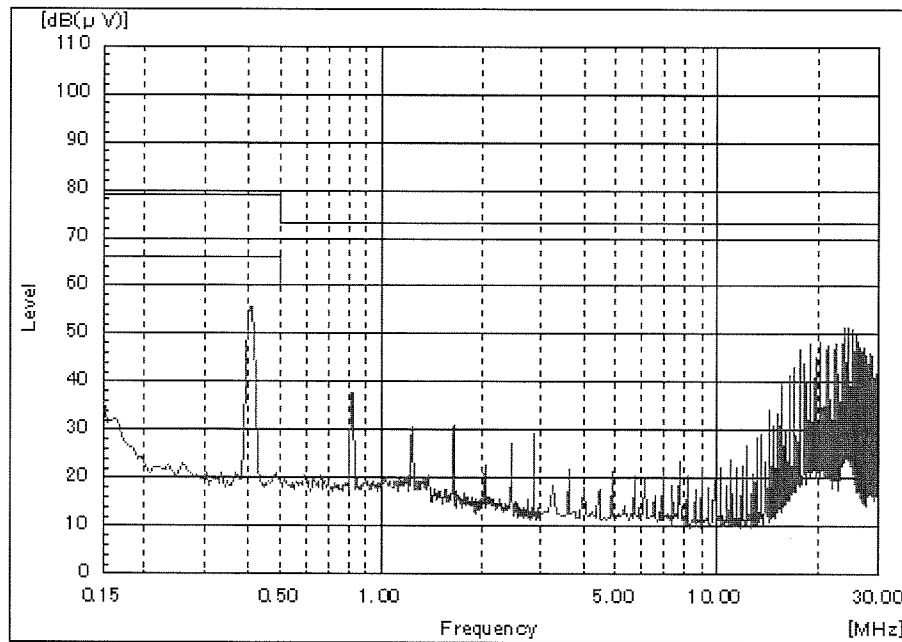
VCCI class A application system

Conditions Vin : 48 VDC

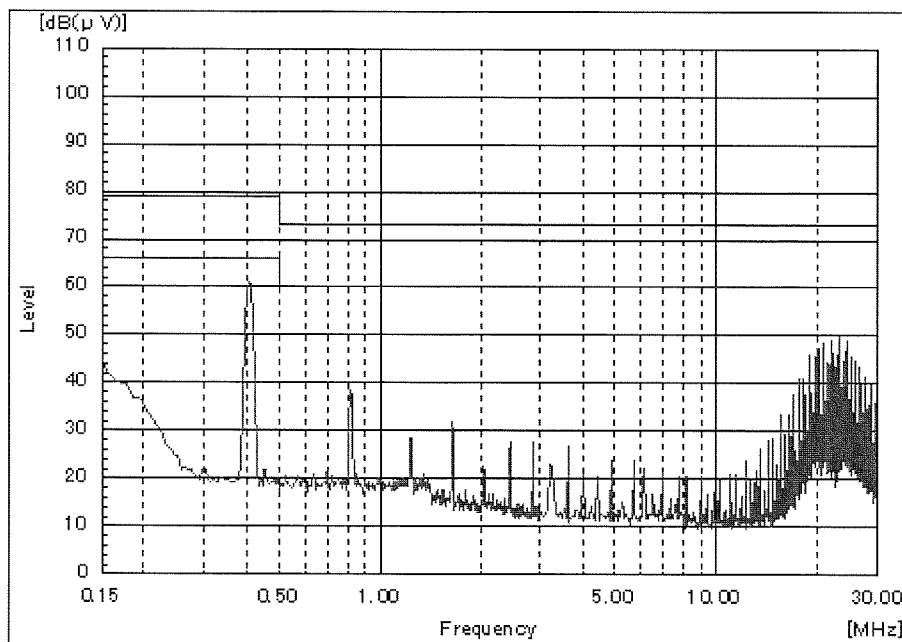
Iout : 100 %

Ta : 25 °C

1.8V



3.3V



EMI特性

Electro-Magnetic Interference characteristics

(a) 雑音端子電圧 (帰還ノイズ)

Conditions Vin : 48 VDC

Conducted Emission

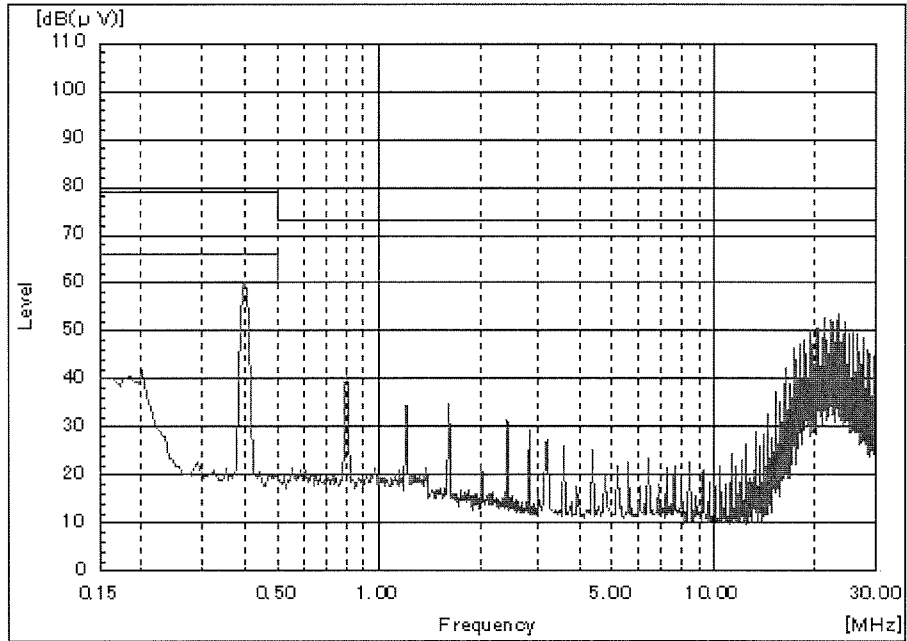
Iout : 100 %

(1) VCCI class A 対応アプリケーションシステム

Ta : 25 °C

VCCI class A application system

5V



EMI特性

Electro-Magnetic Interference characteristics

(b) 雑音電界強度 (輻射ノイズ)

Conditions Vin : 48 VDC

Radiated Emission

Iout : 100 %

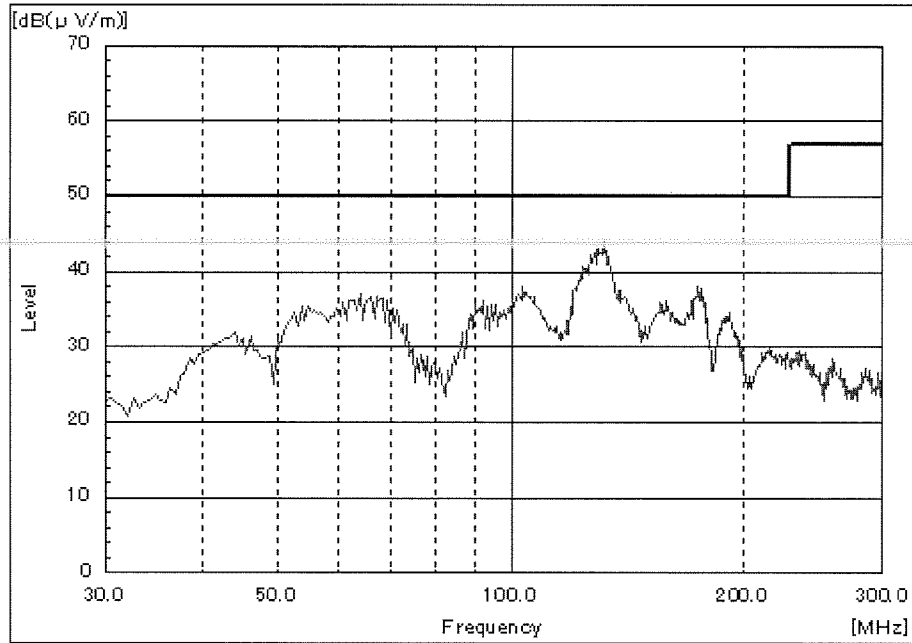
(1) VCCI class A 対応アプリケーションシステム

Ta : 25 °C

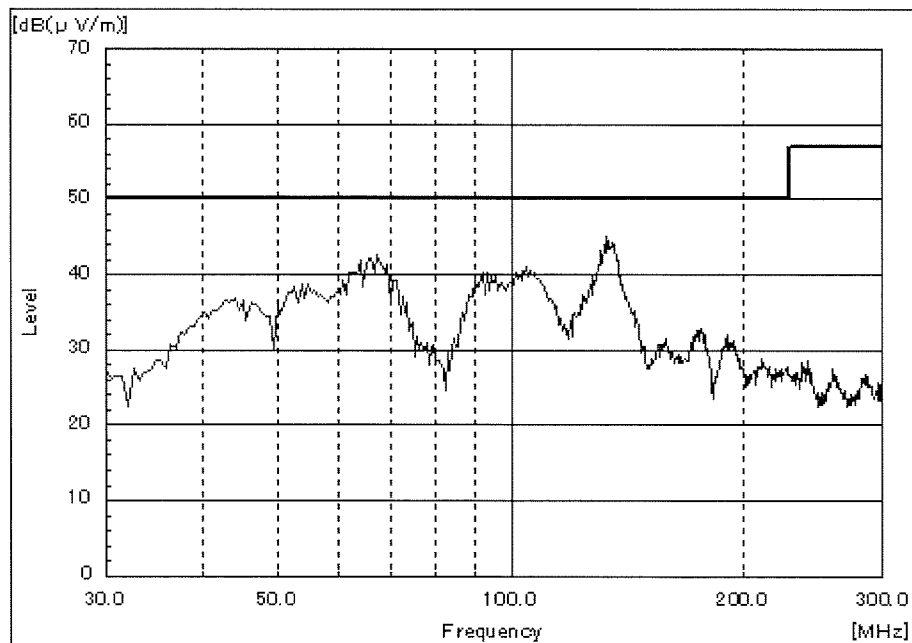
VCCI class A application system

1.8V

HORIZONTAL:



VERTICAL:



EMI特性

Electro-Magnetic Interference characteristics

(b) 雑音電界強度 (輻射ノイズ)

Radiated Emission

(1) VCCI class A 対応アプリケーションシステム

VCCI class A application system

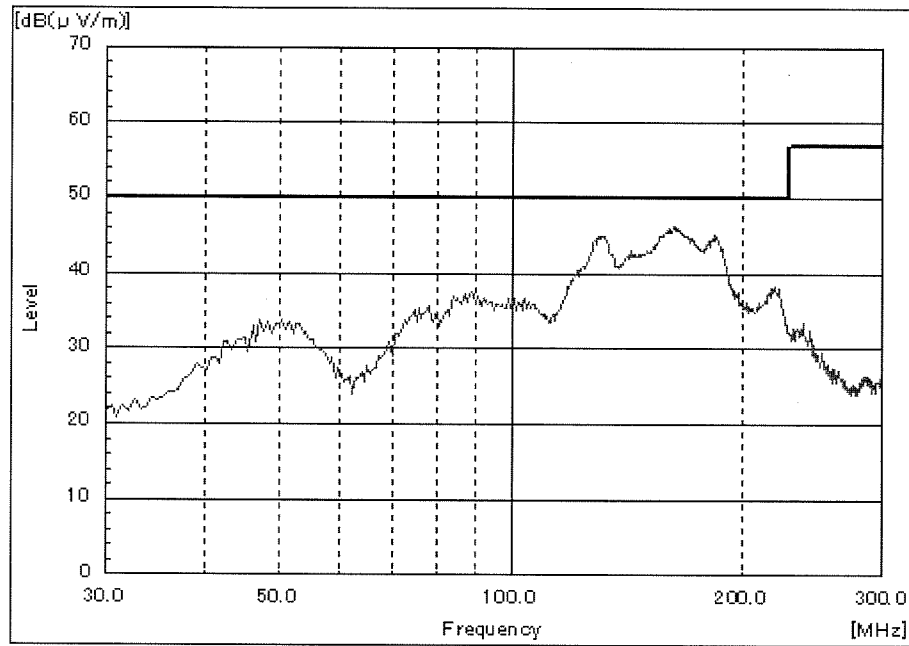
Conditions Vin : 48 VDC

Iout : 100 %

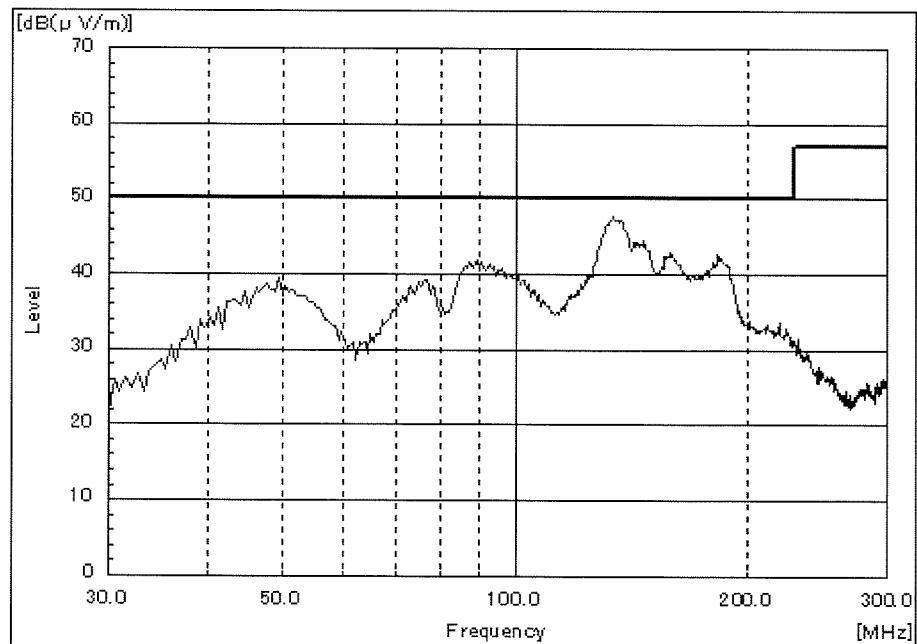
Ta : 25 °C

3.3V

HORIZONTAL:



VERTICAL:



EMI特性

Electro-Magnetic Interference characteristics

(b) 雑音電界強度 (輻射ノイズ)

Conditions Vin : 48 VDC

Radiated Emission

Iout : 100 %

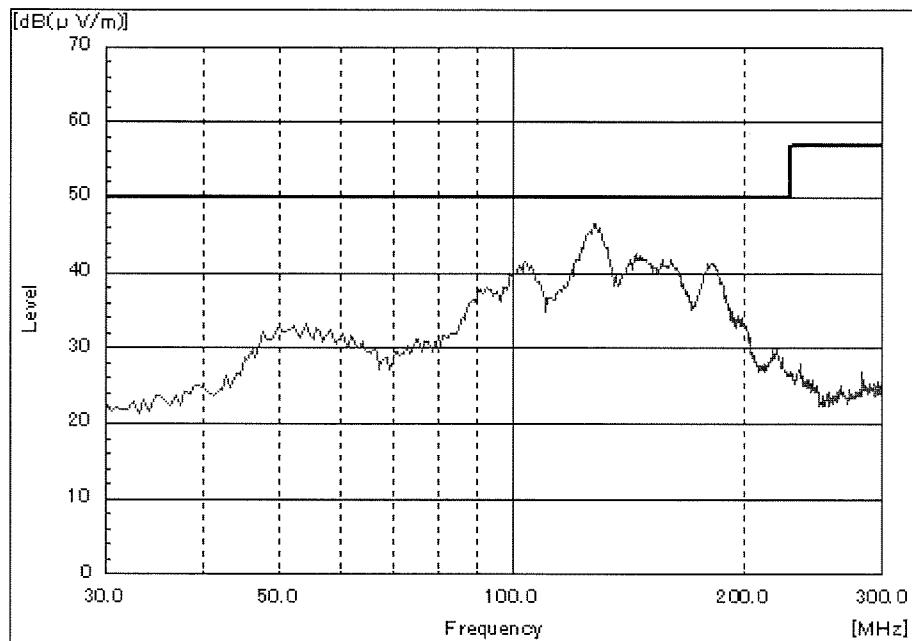
(1) VCCI class A 対応アプリケーションシステム

Ta : 25 °C

VCCI class A application system

5V

HORIZONTAL:



VERTICAL:

