

PSS3-48- *

EVALUATION DATA

型式データ

DWG.No. C187-53-01B		
承認	査閲	担当
N. Uesono 15. Sep. '05	K. Yokoyama 30. Aug. '05	M. Hirai 30. Aug. '05

DENSEI-LAMBDA

INDEX

1. 測定方法	Evaluation Method	PAGE
1.1 測定回路	Circuits used for determination	T-1～5
(1) 静特性	Steady state data	
(2) 通電ドリフト特性	Warm up voltage drift characteristics	
(3) 過電流保護特性	Over current protection (OCP) characteristics	
(4) 出力立ち上がり特性	Output rise characteristics	
(5) 出力立ち下がり特性	Output fall characteristics	
(6) 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	
(7) 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	
(8) 過渡応答 (負荷急変) 特性	Dynamic load response characteristics	
(9) 入力サージ電流 (突入電流) 特性	Inrush current characteristics	
(10) 出力リップル、ノイズ波形	Output ripple and noise waveform	
(11) スイッチング周波数対出力電力	Switching frequency v.s. output power	
(12) EMI特性	Electro-Magnetic Interference characteristics	
1.2 使用測定機器	List of equipments used	T-6
2. 特性データ	Characteristics	
2.1 (1) 入力・負荷・温度変動	Regulation - line and load, temperature drift	T-7～8
(2) 出力電圧・リップル電圧対入力電圧	Output voltage and ripple voltage v.s. input voltage	T-9～10
(3) 効率・入力電流対出力電流	Efficiency and input current v.s. output current	T-11～12
(4) 効率対入力電圧	Efficiency v.s. input voltage	T-13～14
2.2 通電ドリフト特性	Warm up voltage drift characteristics	T-15
2.3 過電流保護特性	Over current protection (OCP) characteristics	T-16～17
2.4 出力立ち上がり特性	Output rise characteristics	T-18～19
2.5 出力立ち下がり特性	Output fall characteristics	T-20～21
2.6 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	T-22～23
2.7 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	T-24～25
2.8 過渡応答 (負荷急変) 特性	Dynamic load response characteristics	T-26～27

2.9 入力サージ電流（突入電流）特性	Inrush current waveform	T-28
2.10 出力リップル、ノイズ波形	Output ripple and noise waveform	T-29
2.11 スイッチング周波数対出力電力	Switching frequency v.s. output power	T-30
2.12 EMI特性	Electro-Magnetic Interference characteristics	
VCCI class A 対応アプリケーションシステム		
	VCCI class A application system	T-31～32

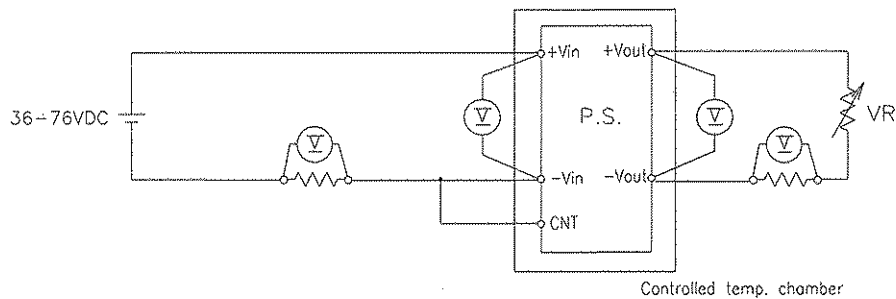
使用記号 Terminology used

	Definition		
Vin		入力電圧	Input Voltage
Vout		出力電圧	Output Voltage
Von/off		ON/OFF電圧	ON/OFF Voltage
Iin		入力電流	Input Current
Iout		出力電流	Output Current
Ta		周囲温度	Ambient Temperature

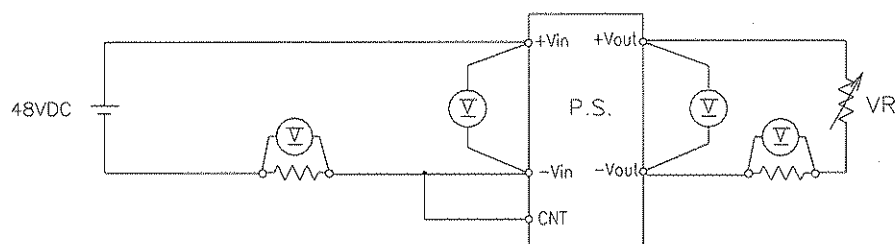
1. 測定方法 Evaluation Method

1.1 測定回路 Circuits used for determination

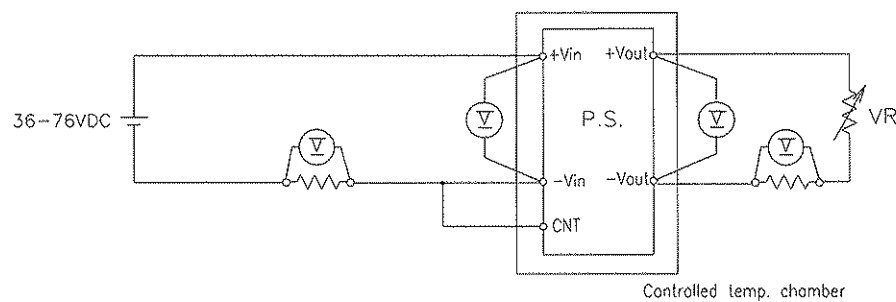
(1) 静特性 Steady state data



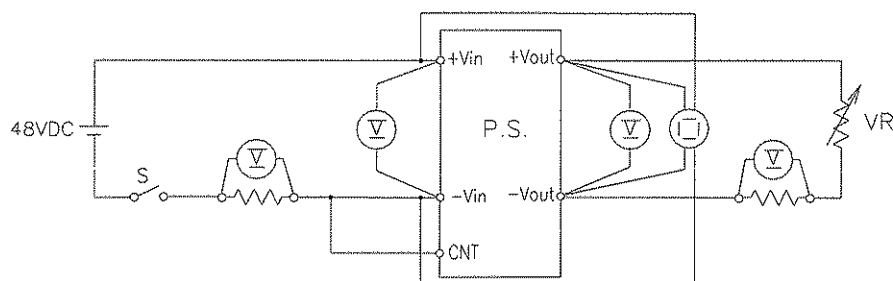
(2) 通電ドリフト特性 Warm up voltage drift characteristics



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



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



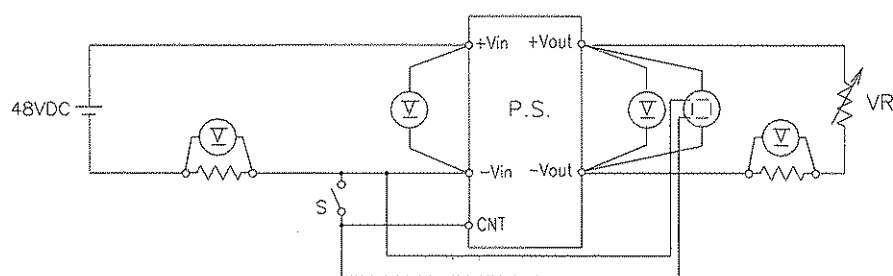
(5) 出力立ち下がり特性 Output fall characteristics

出力立ち上がり特性と同じ

Same as output rise characteristics

(6) 出力立ち上がり特性 (ON/OFFコントロール時)

Output rise characteristics with CONTROL ON/OFF



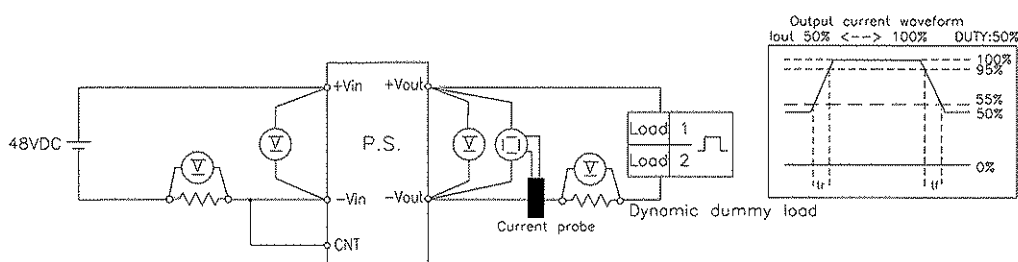
(7) 出力立ち下がり特性 (ON/OFFコントロール時)

Output fall characteristics with CONTROL ON/OFF

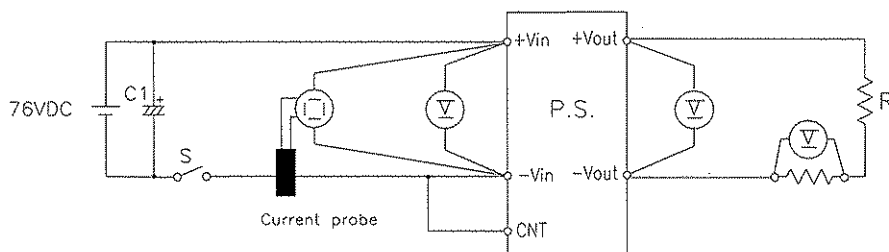
出力立ち上がり特性 (ON/OFFコントロール時) と同じ

Same as output rise characteristics with CONTROL ON/OFF

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

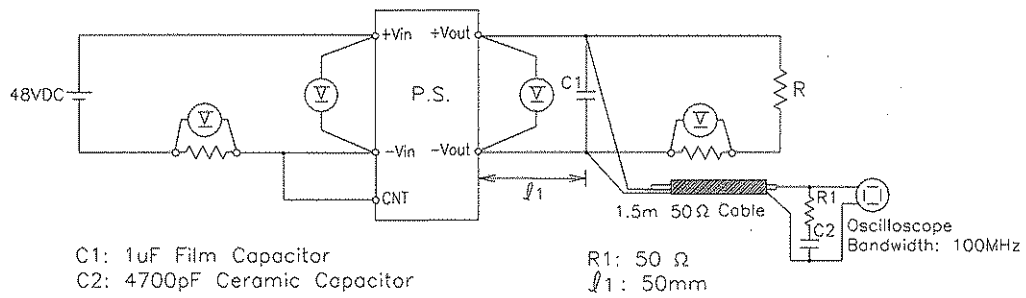


(9) 入力サージ電流 (突入電流) 特性 Inrush current characteristics

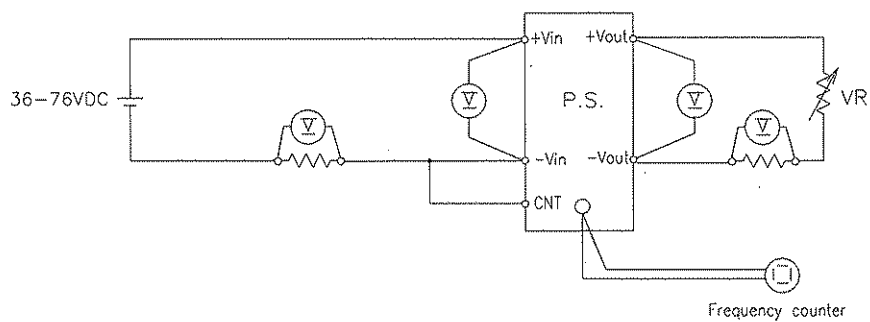


C1: 4000uF Electrolytic Capacitor

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

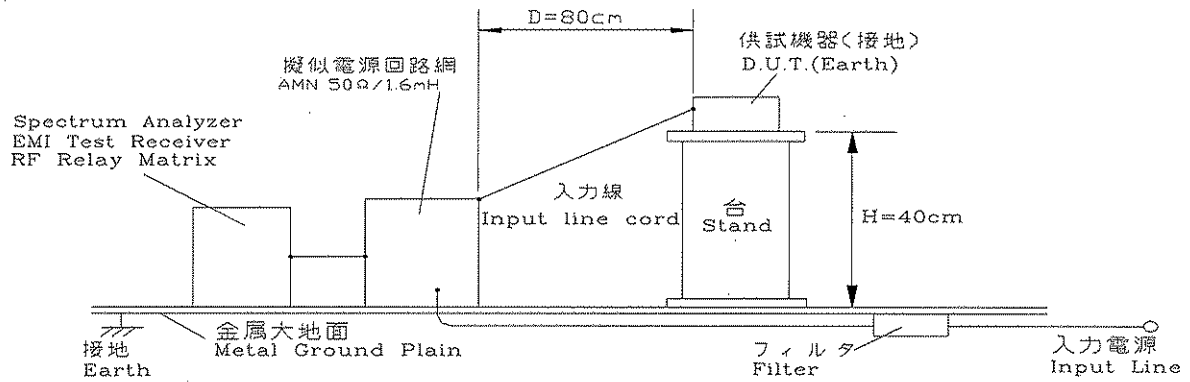


(11) スイッチング周波数対出力電力 Switching frequency v.s. output power

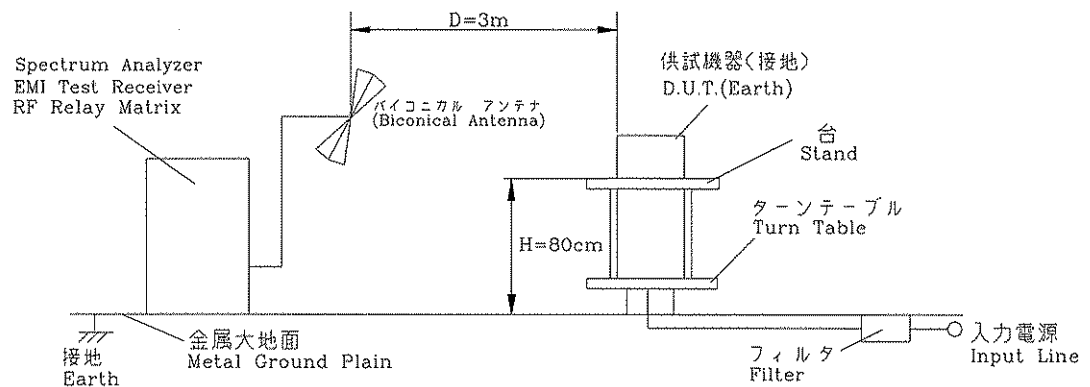


(12) EMI 特性 Electro-Magnetic Interference characteristics

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

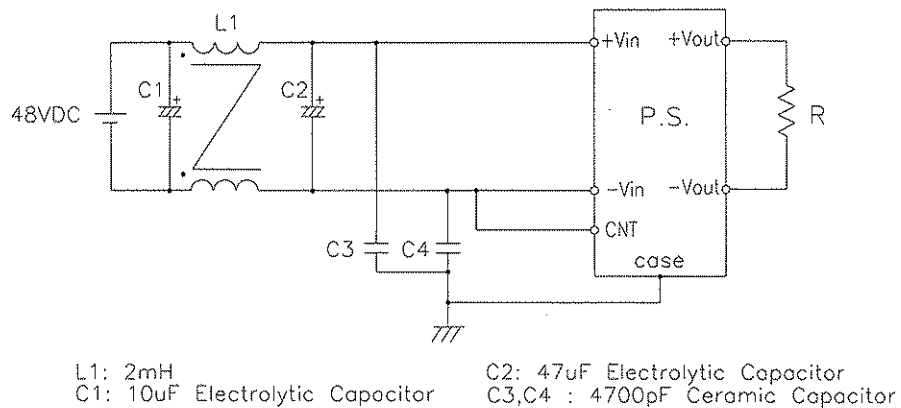


(b) 雑音電界強度 (輻射ノイズ) Radiated Emission Noise



(1) VCCI class A 対応アプリケーションシステム

VCCI class A application system



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	YOKOGAWA ELECT.	DL1740
3	DIGITAL STORAGE OSCILLOSCOPE	TEKTRONIX	TDS540D
4	DIGITAL MULTIMETER	AGILENT	34970A
5	CURRENT PROBE/AMPLIFIER	TEKTRONIX	A6303/TM503B
6	SHUNT RESISTER	YOKOGAWA ELECT.	2215
7	DYNAMIC DUMMY LOAD	TAKASAGO	FK-200L
8	INPUT POWER SUPPLY	TAKASAGO	AA2000XG
9	CONTROLLED TEMP. CHAMBER	TABAI ESPEC	SU-261
10	SPECTRUM ANALYZER	ROHDE & SCHWARZ	FSA
11	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESHS10
12	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESVS10
13	RF RELAY MATRIX	ROHDE & SCHWARZ	PSU
14	AMN	KYORITU DENSHI	KNW-242
15	ANTENNA(BICONICAL ANTENNA)	SCHWARZBECK	BBA9106

2. 特性データ Characteristics

2.1 静特性 Steady state data

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

3.3V

1. Regulation - line and load

Condition Ta : 25°C

Iout \ Vin	36VDC	48VDC	76VDC	line regulation	
0%	3.270V	3.270V	3.271V	1.0mV	0.031%
50%	3.270V	3.270V	3.270V	0.0mV	0.000%
100%	3.269V	3.269V	3.269V	0.0mV	0.000%
load regulation	1.0mV	1.0mV	2.0mV		
	0.03%	0.03%	0.06%		

2. Temperature drift

Conditions Vin : 48VDC

Iout : 100%

Ta	-40°C	25°C	85°C	temperature stability	
Vout	3.254V	3.269V	3.267V	15.0mV	0.46%

5V

1. Regulation - line and load

Condition Ta : 25°C

Iout \ Vin	36VDC	48VDC	76VDC	line regulation	
0%	4.985V	4.985V	4.985V	0.0mV	0.000%
50%	4.984V	4.984V	4.984V	0.0mV	0.000%
100%	4.984V	4.984V	4.984V	0.0mV	0.000%
load regulation	1.0mV	1.0mV	1.0mV		
	0.02%	0.02%	0.02%		

2. Temperature drift

Conditions Vin : 48VDC

Iout : 100%

Ta	-40°C	25°C	85°C	temperature stability	
Vout	4.962V	4.984V	4.983V	22.0mV	0.44%

2. 特性データ Characteristics

2.1 静特性 Steady state data

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

12V

1. Regulation - line and load

Condition Ta : 25°C

Iout \ Vin	36VDC	48VDC	76VDC	line regulation	
0%	12.066V	12.066V	12.069V	3.0mV	0.025%
50%	12.065V	12.065V	12.065V	0.0mV	0.000%
100%	12.065V	12.065V	12.065V	0.0mV	0.000%
load regulation	1.0mV	1.0mV	4.0mV		
	0.01%	0.01%	0.03%		

2. Temperature drift

Conditions Vin : 48VDC

Iout : 100%

Ta	-40°C	25°C	85°C	temperature stability	
Vout	12.004V	12.065V	12.081V	77.0mV	0.64%

2.1 (2) 出力電圧・リップル電圧対入力電圧

Output voltage and ripple voltage v.s. input voltage

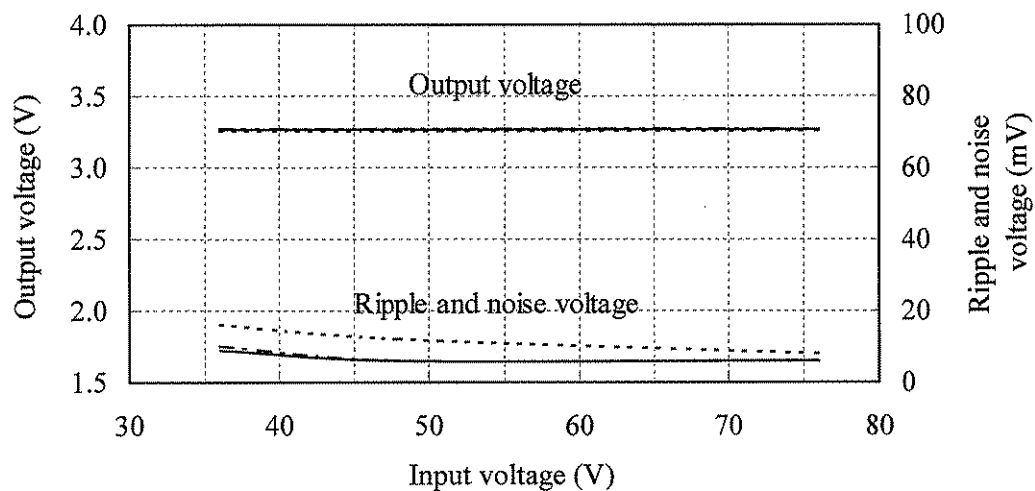
Conditions Iout : 100 %

Ta : -40 °C -----

25 °C -----

85 °C -----

3.3V

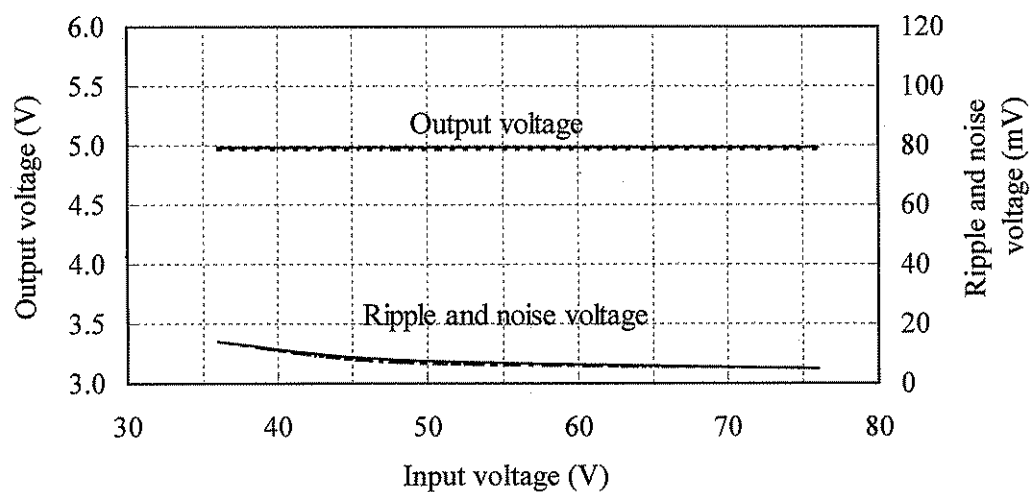


Ta : -40 °C -----

25 °C -----

85 °C -----

5V



2.1 (2) 出力電圧・リップル電圧対入力電圧

Output voltage and ripple voltage v.s. input voltage

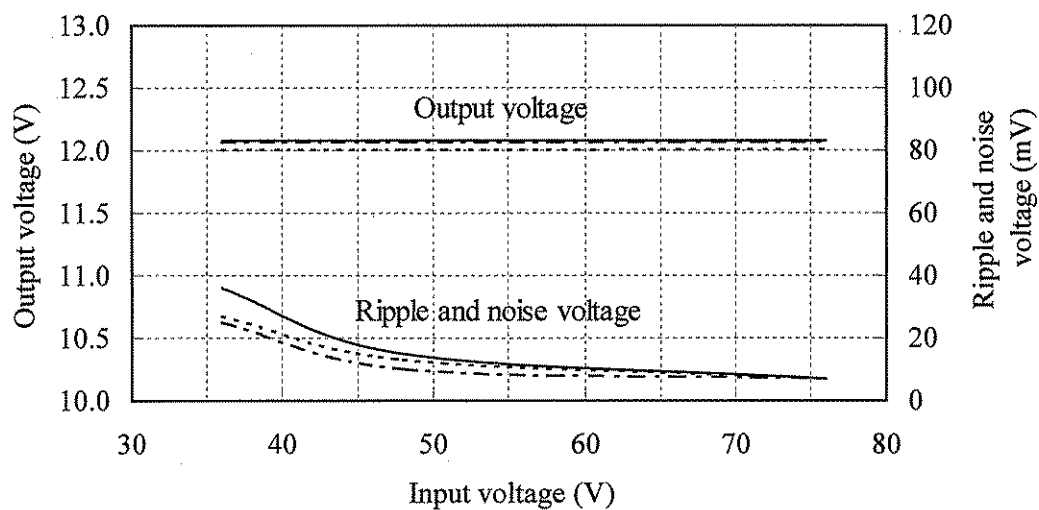
Conditions Iout : 100 %

Ta : -40 °C -----

25 °C -----

85 °C -----

12V



2.1 (3) 効率・入力電流対出力電流

Efficiency and input current v.s. output current

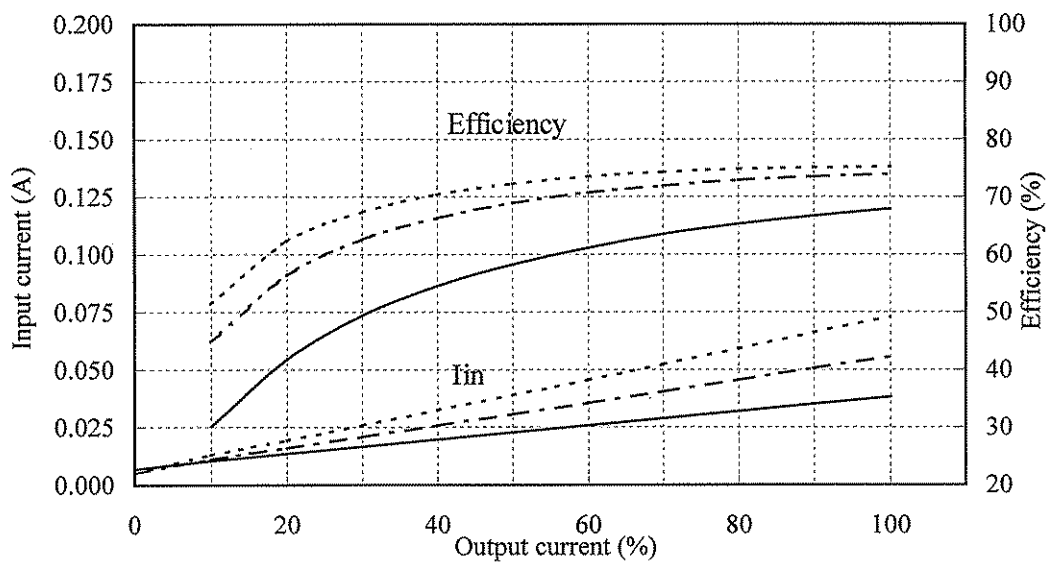
Conditions V_{in} : 36 VDC -----

: 48 VDC - - - - -

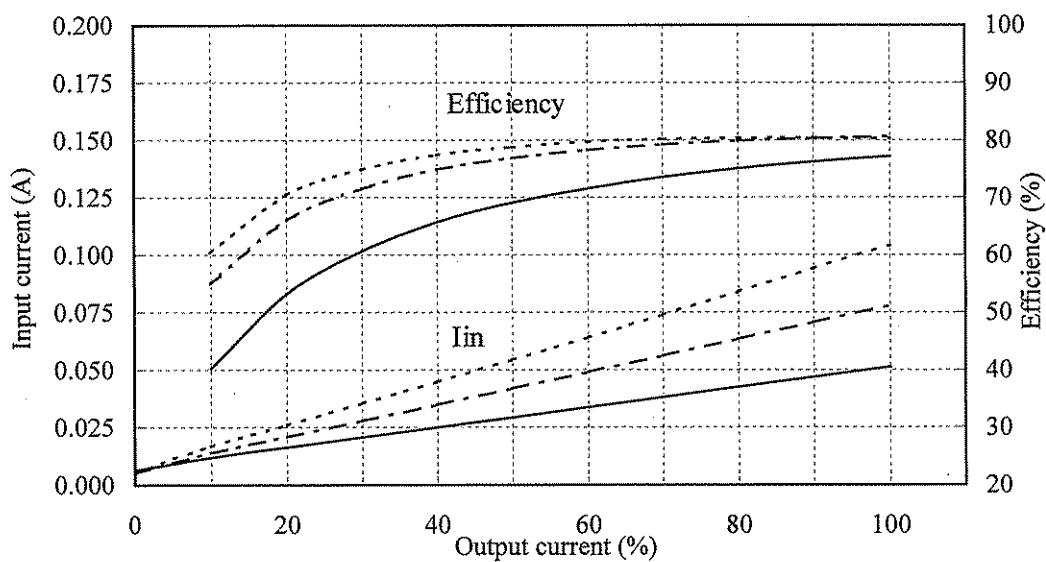
: 76 VDC ———

 T_a : 25 °C

3.3V



5V



2.1 (3) 効率・入力電流対出力電流

Efficiency and input current v.s. output current

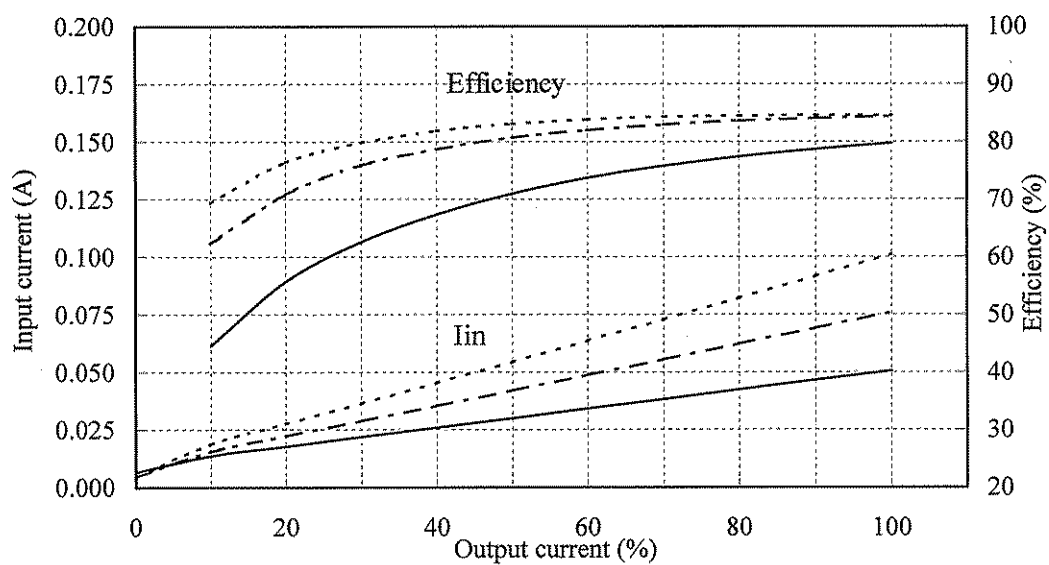
Conditions V_{in} : 36 VDC -----

: 48 VDC - - - - -

: 76 VDC ———

T_a : 25 °C

12V



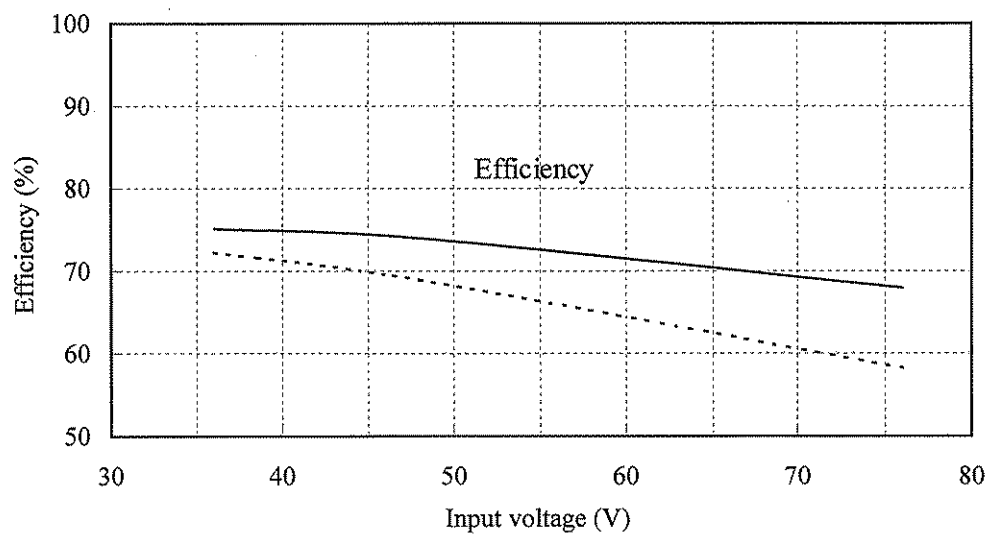
2.1 (4) 効率対入力電圧

Efficiency v.s. input voltage

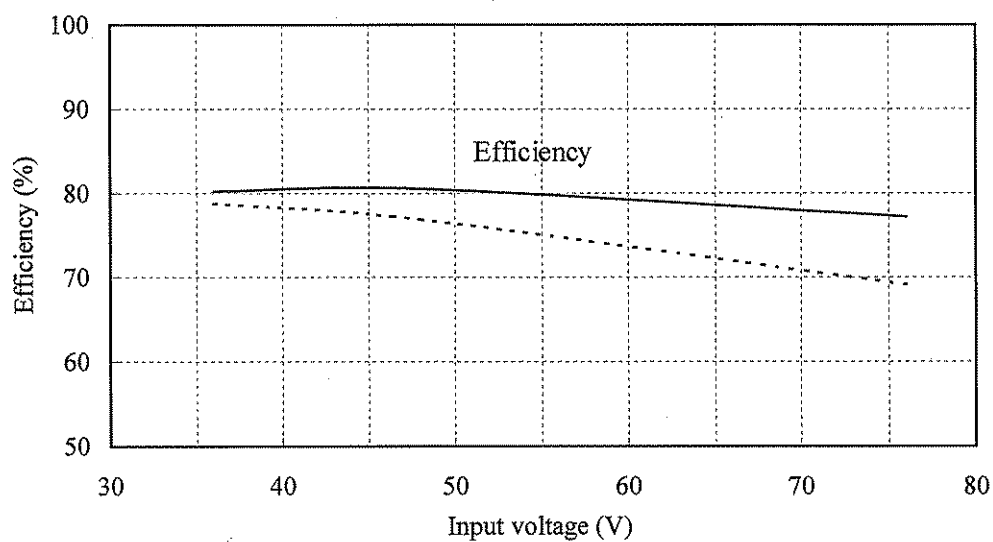
Conditions T_a : 25 °C I_{out} : 50 % -----

100 % ———

3.3V



5V



2.1 (4) 効率対入力電圧

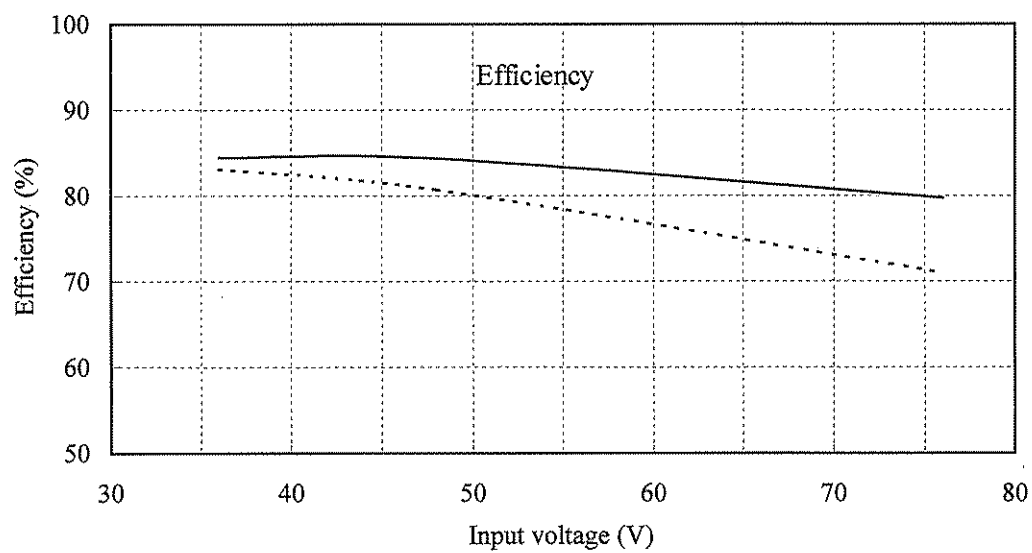
Efficiency v.s. input voltage

Conditions Ta : 25 °C

Iout : 50 % -----

100 % ———

12V

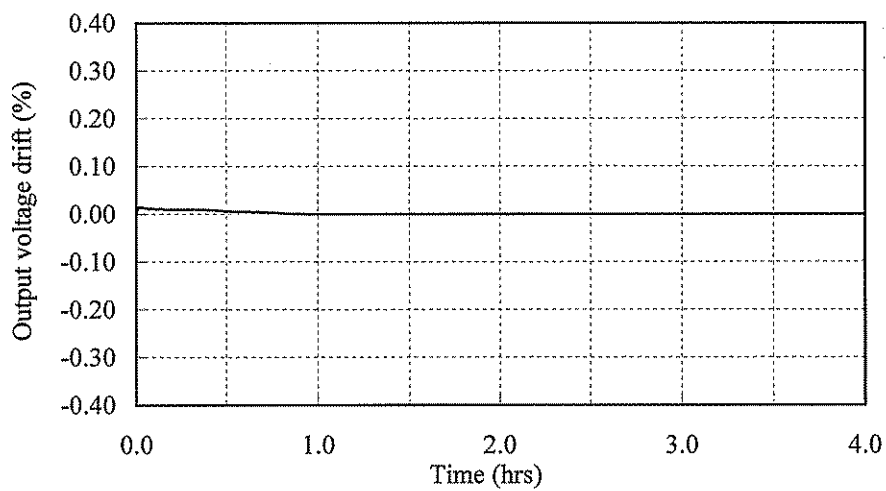


2.2 通電ドリフト特性

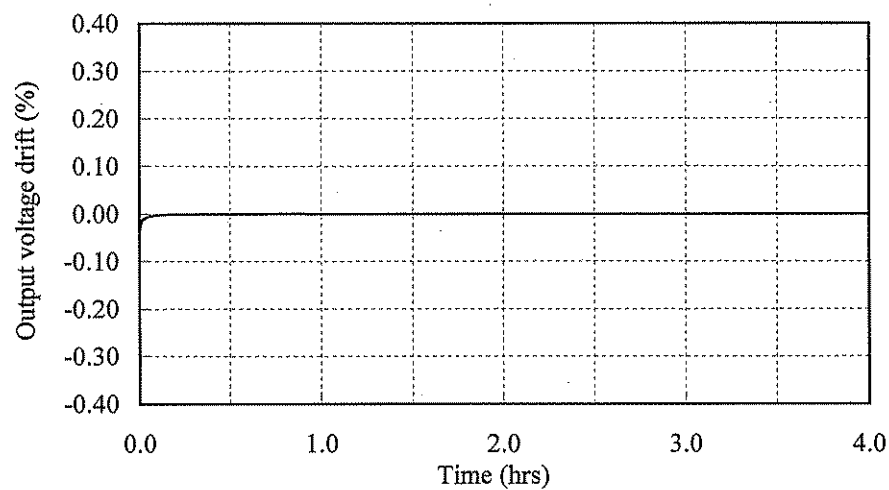
Warm up voltage drift characteristics

Conditions V_{in} : 48 VDC I_{out} : 100 % T_a : 25 °C

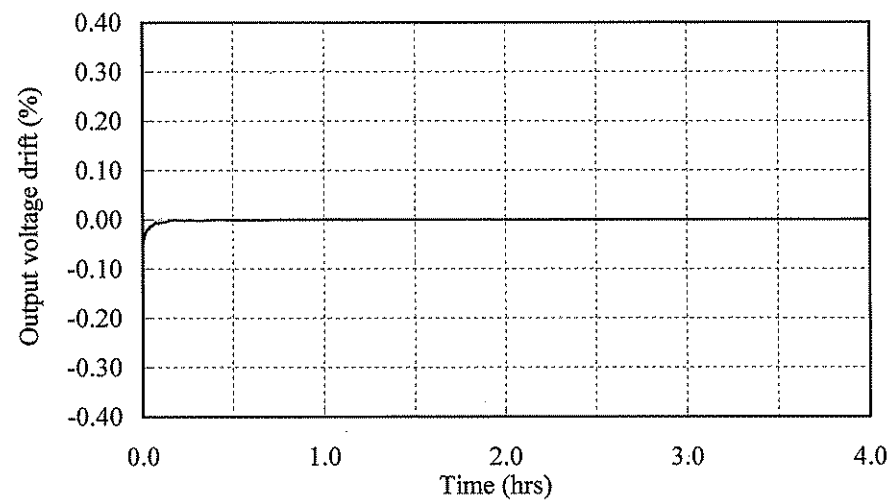
3.3V



5V



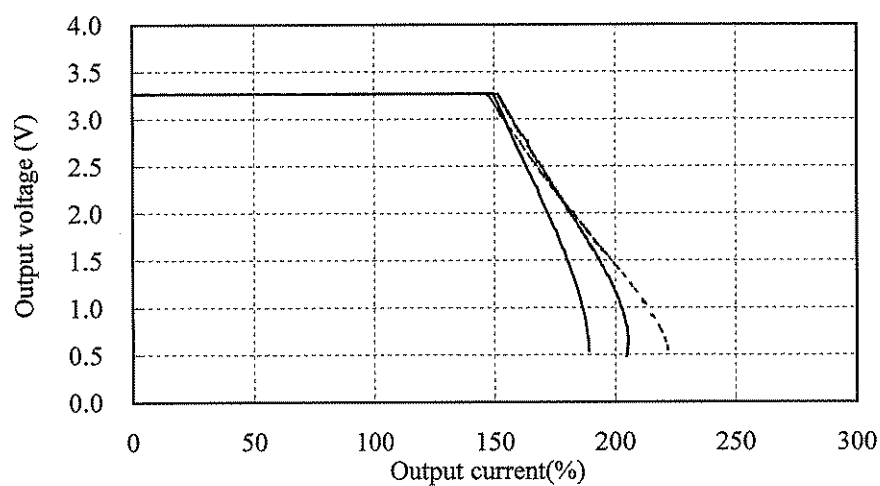
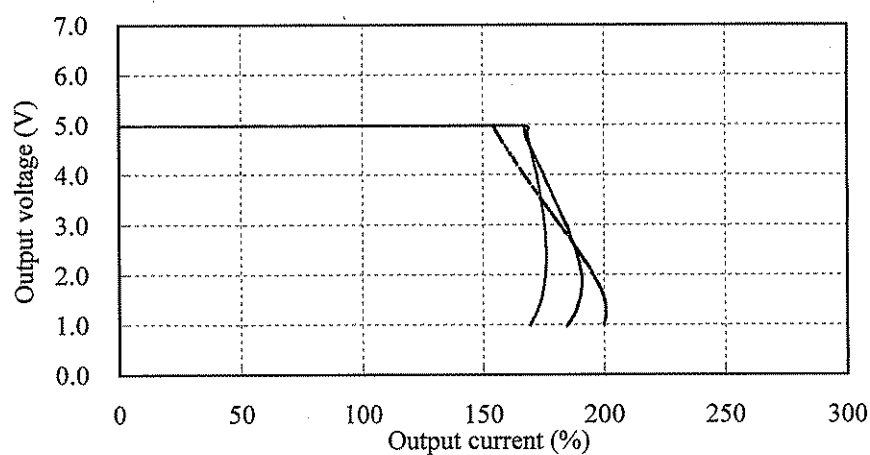
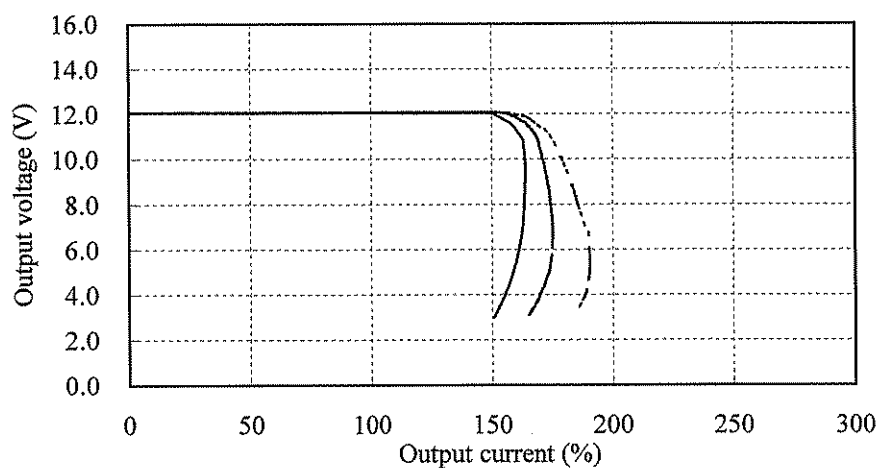
12V



2.3 過電流保護特性

Over current protection (OCP) characteristics

Conditions V_{in} : 36 VDC -----
 48 VDC -----
 76 VDC -----

 T_a : 25 °C**3.3V****5V****12V**

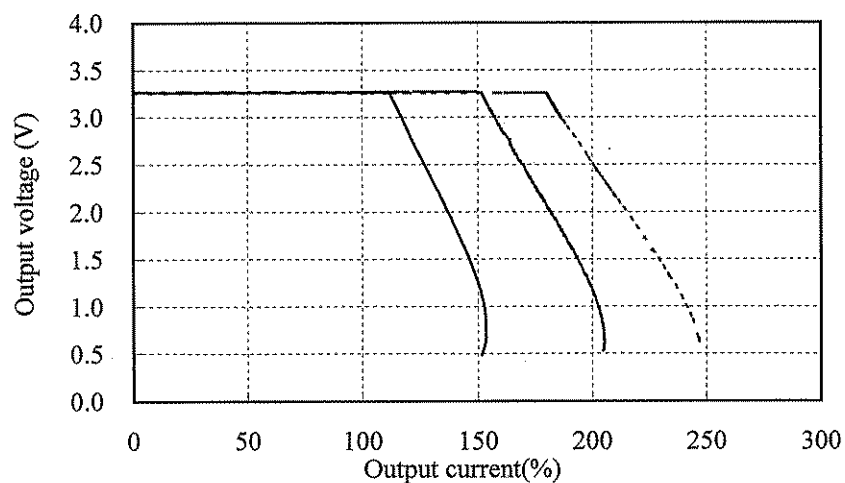
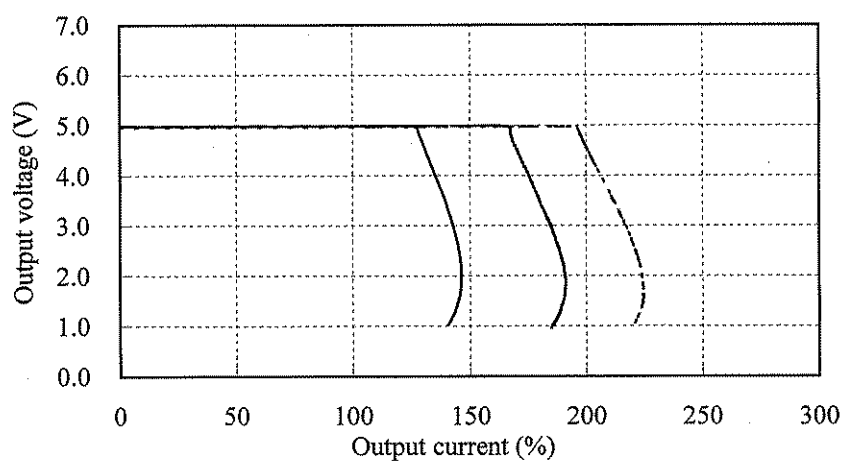
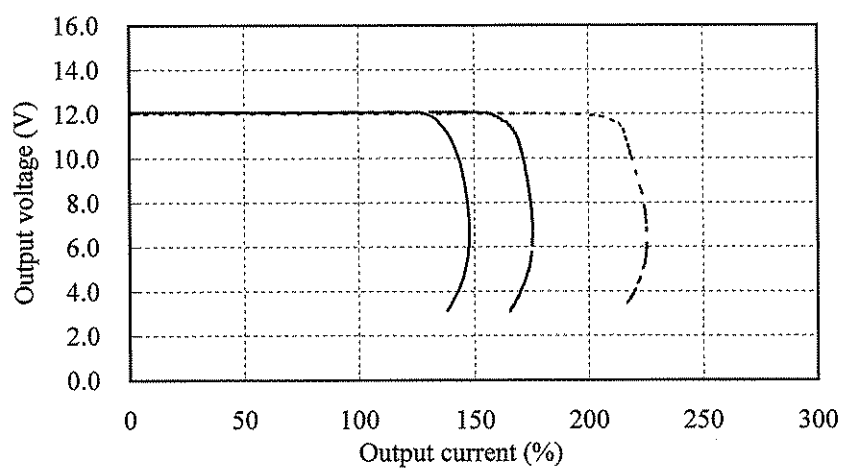
2.3 過電流保護特性

Over current protection (OCP) characteristics

Conditions V_{in} : 48 VDC T_a : -40 °C -----

25 °C - - - - -

85 °C ———

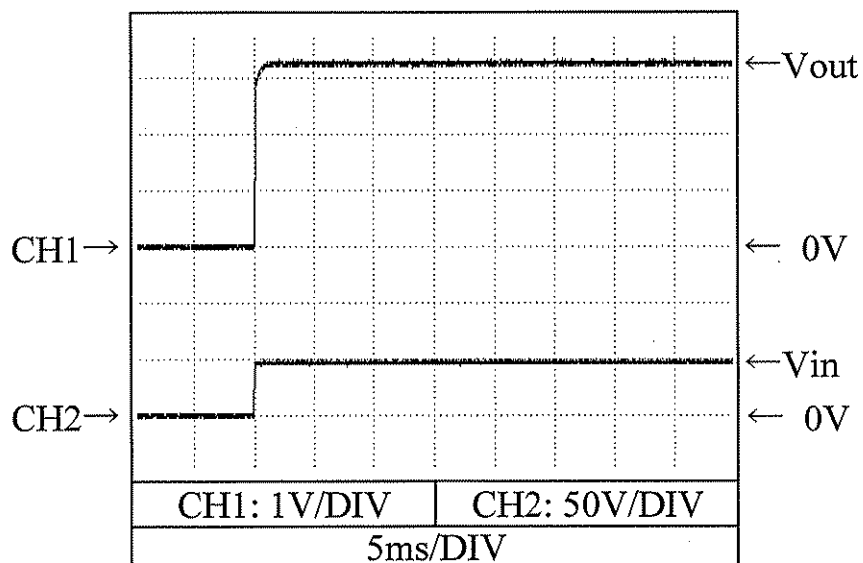
3.3V**5V****12V**

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

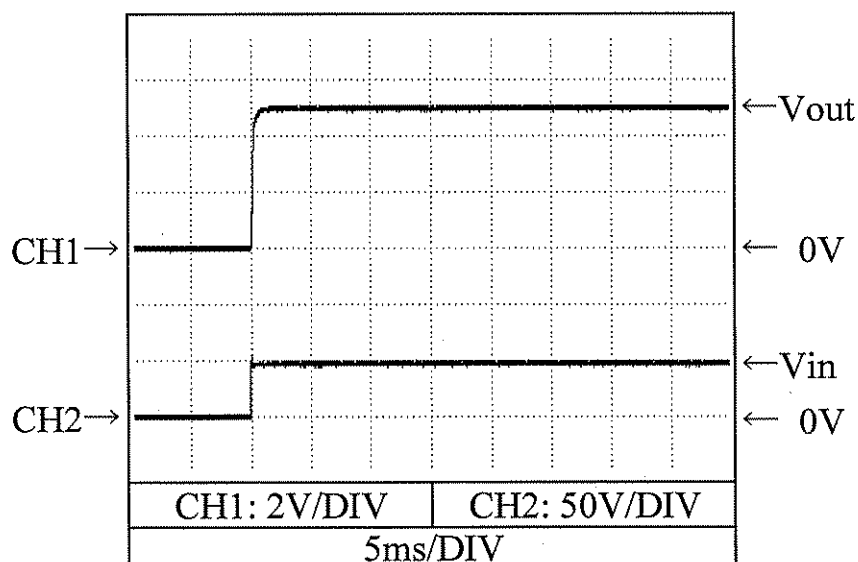
PSS3-48-*

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

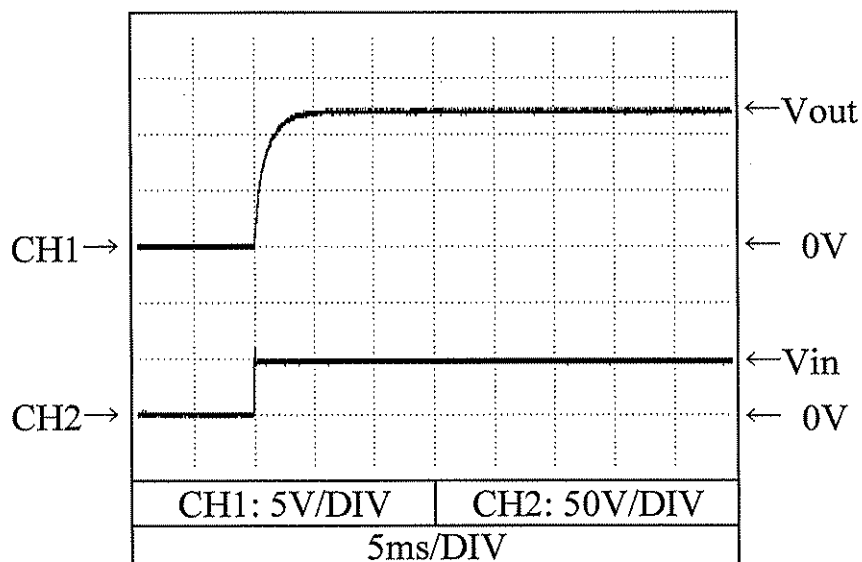
3.3V



5V



12V

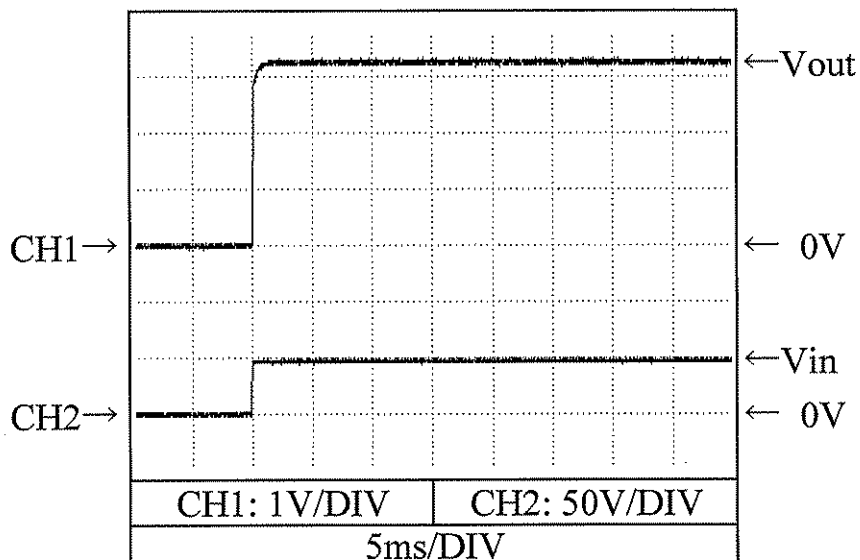


2.4 出力立ち上がり特性
Output rise characteristics

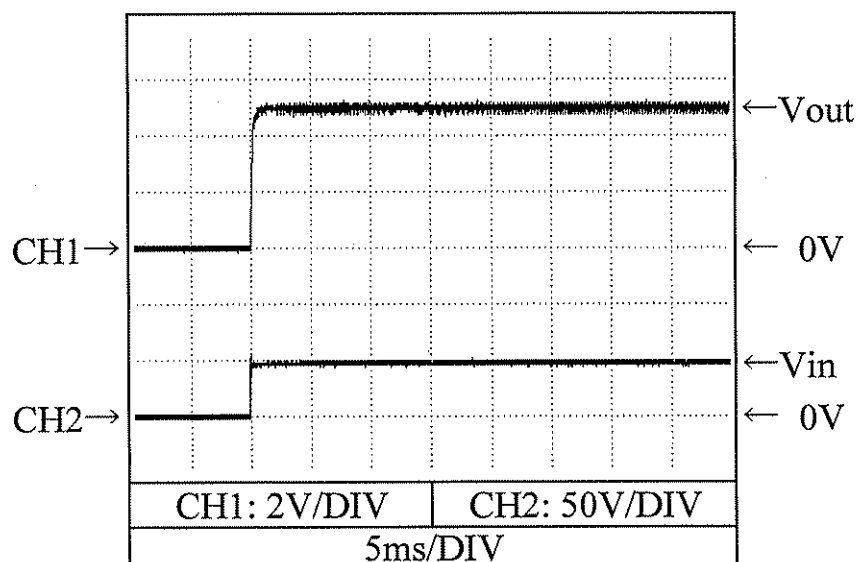
PSS3-48-*

Conditions V_{in} : 48 VDC
 I_{out} : 100 %
 T_a : 25 °C

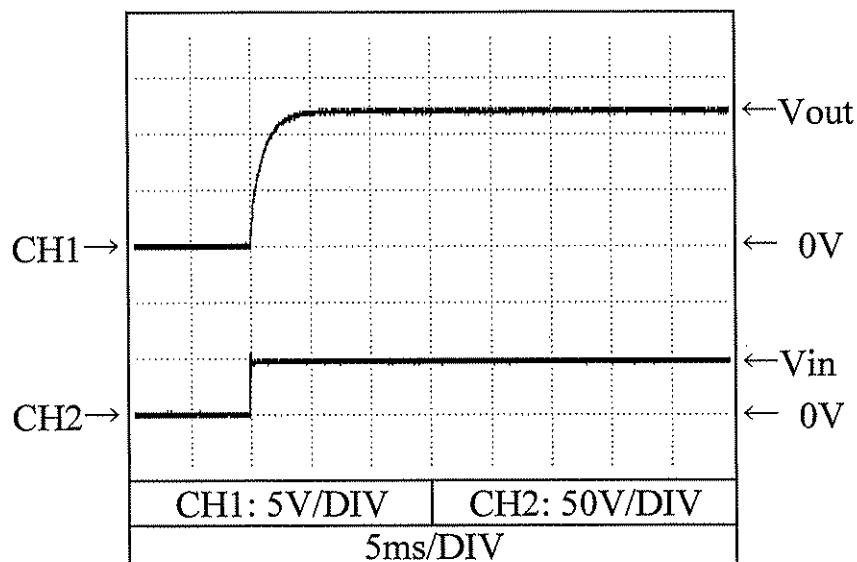
3.3V



5V



12V

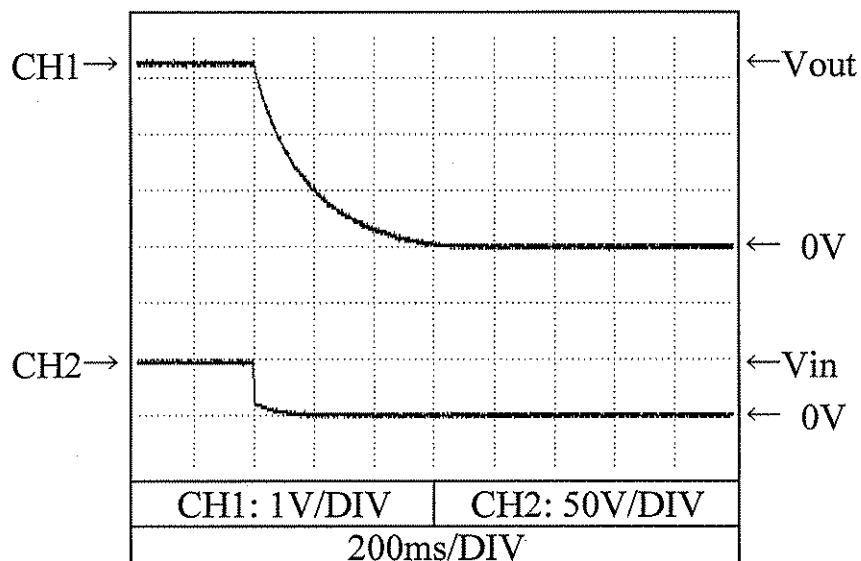


2.5 出力立ち下がり特性
Output fall characteristics

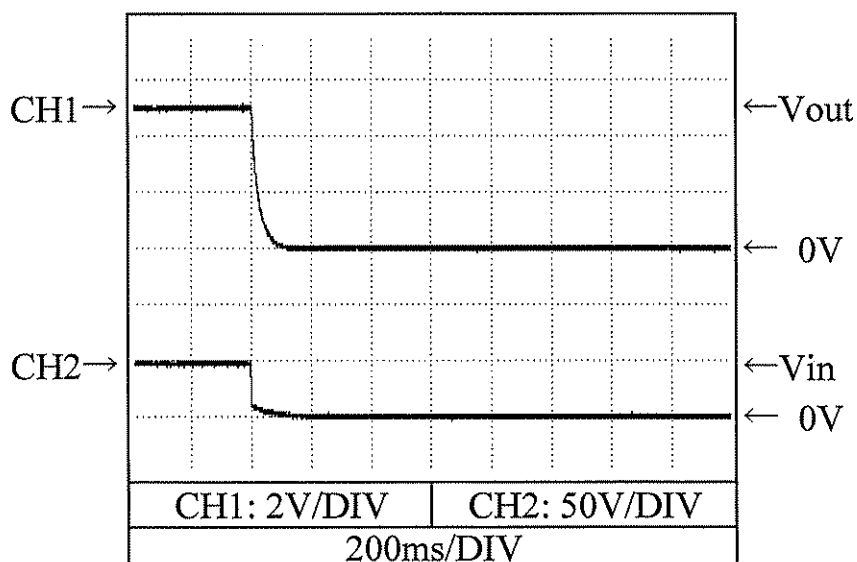
PSS3-48-*

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

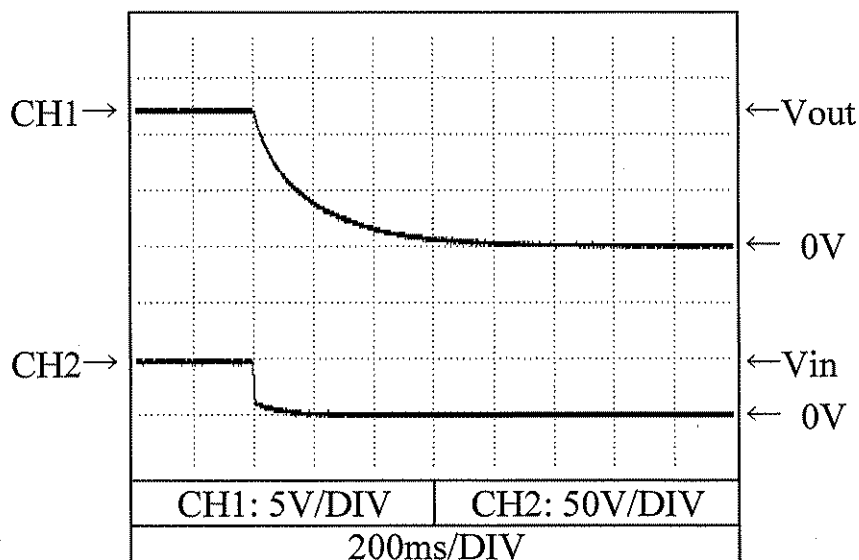
3.3V



5V



12V

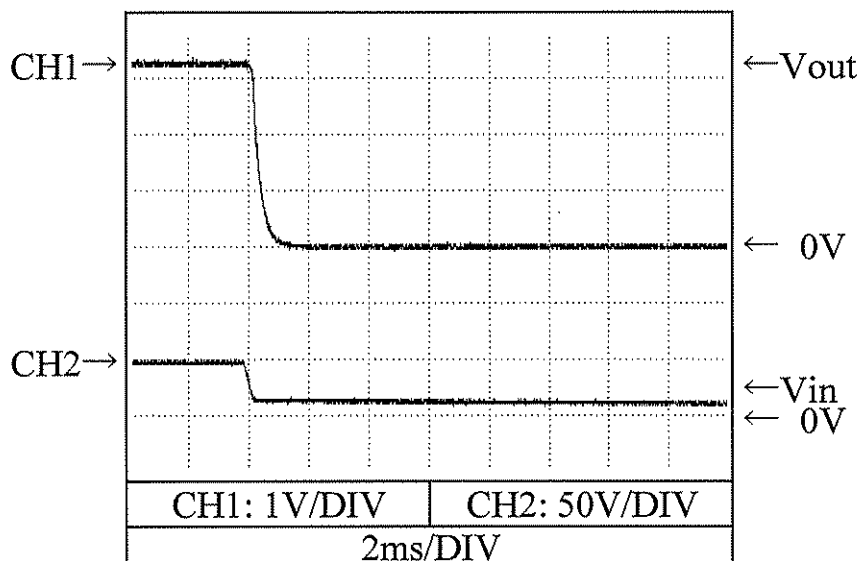


2.5 出力立ち下がり特性
Output fall characteristics

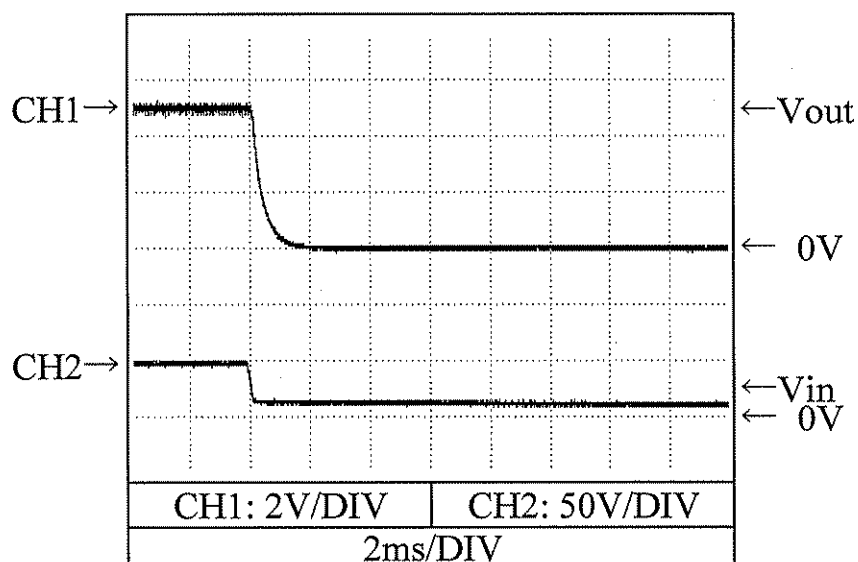
PSS3-48-*

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

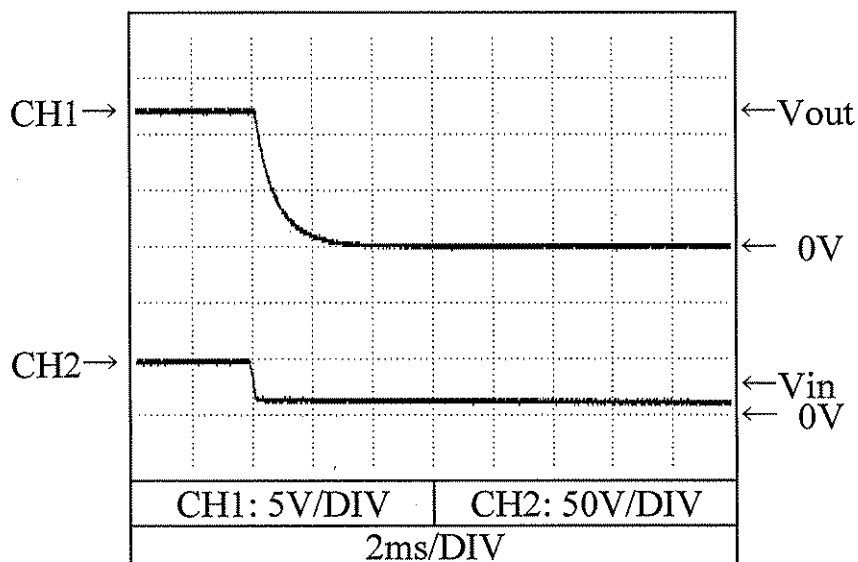
3.3V



5V



12V

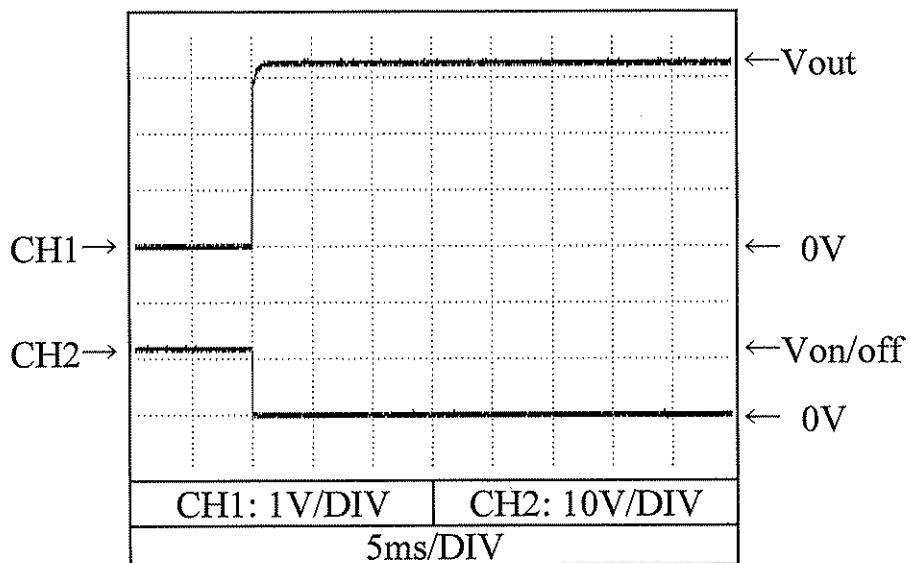


2.6 出力立ち上がり特性 (ON/OFFコントロール時)
Output rise characteristics with ON/OFF CONTROL

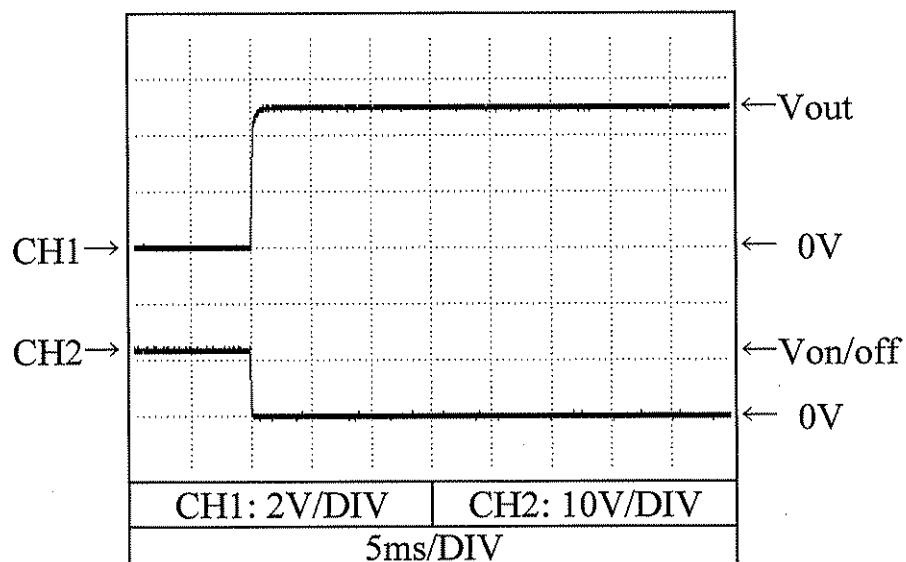
PSS3-48-*

Conditions V_{in} : 48 VDC
 I_{out} : 0 %
 T_a : 25 °C

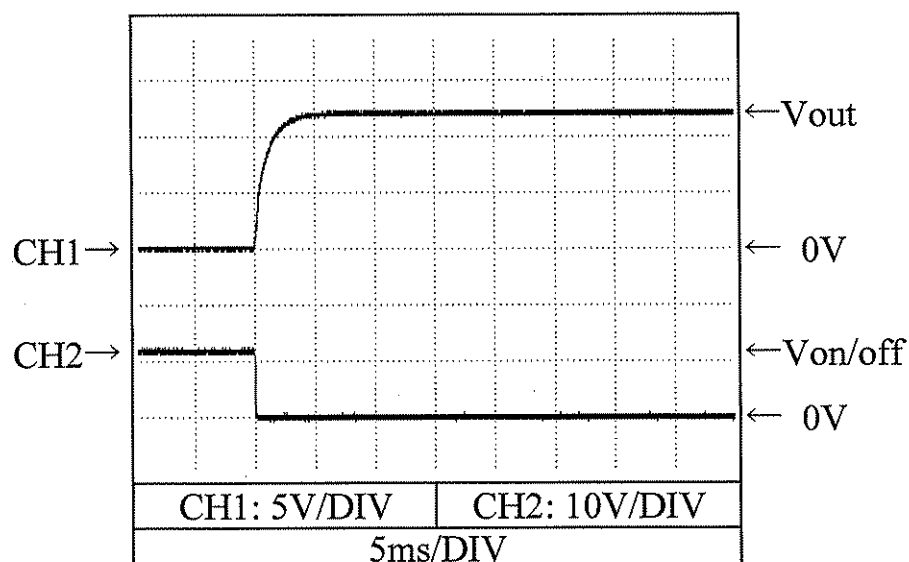
3.3V



5V



12V

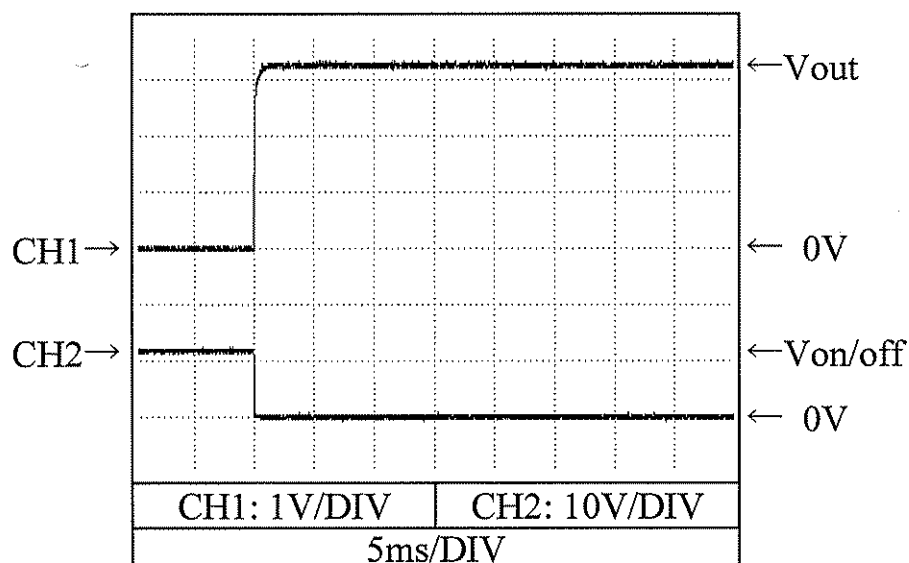


2.6 出力立ち上がり特性 (ON/OFFコントロール時)
Output rise characteristics with ON/OFF CONTROL

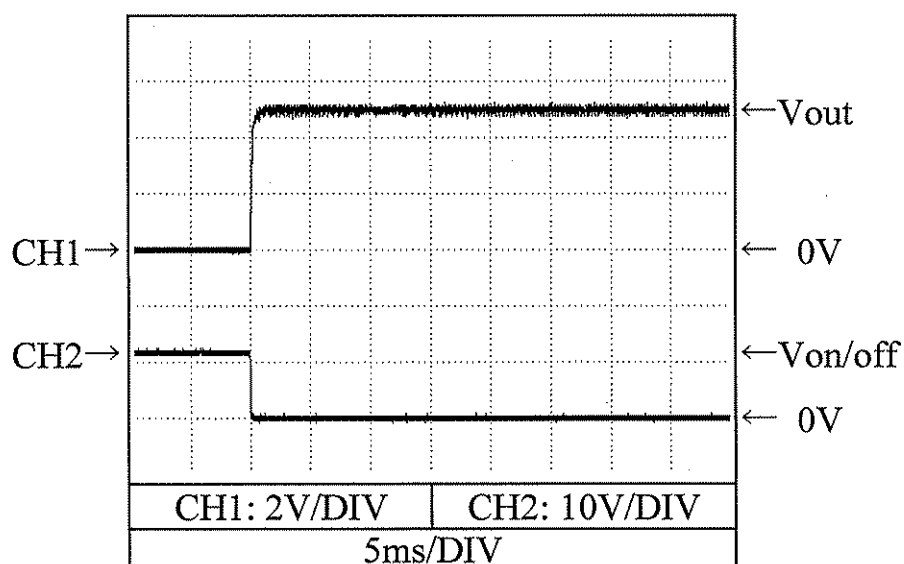
PSS3-48-*

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

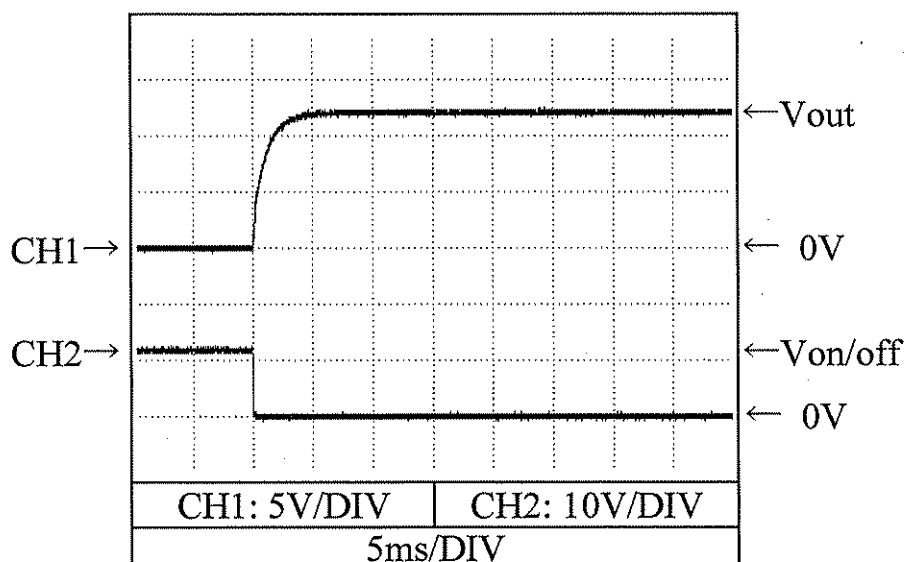
3.3V



5V



12V

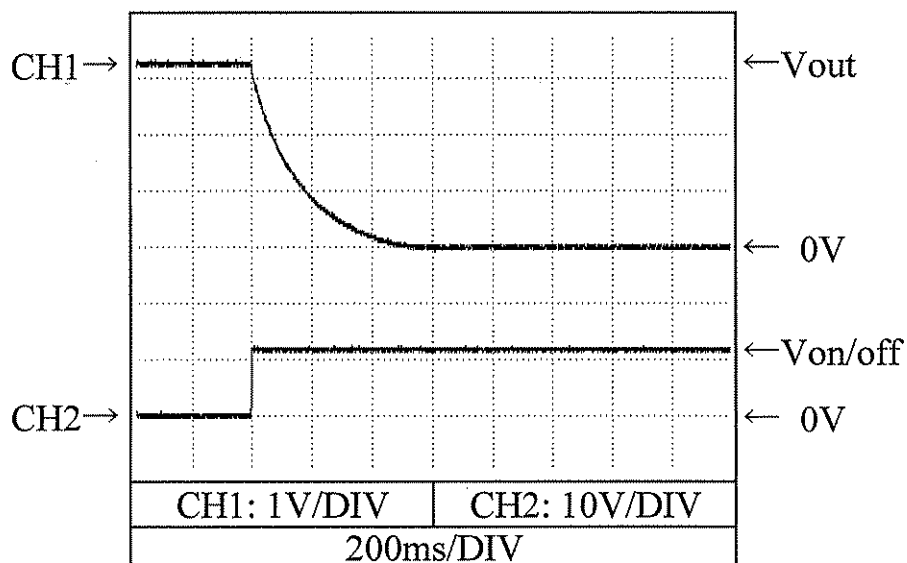


2.7 出力立ち下がり特性 (ON/OFFコントロール時)
Output fall characteristics with ON/OFF CONTROL

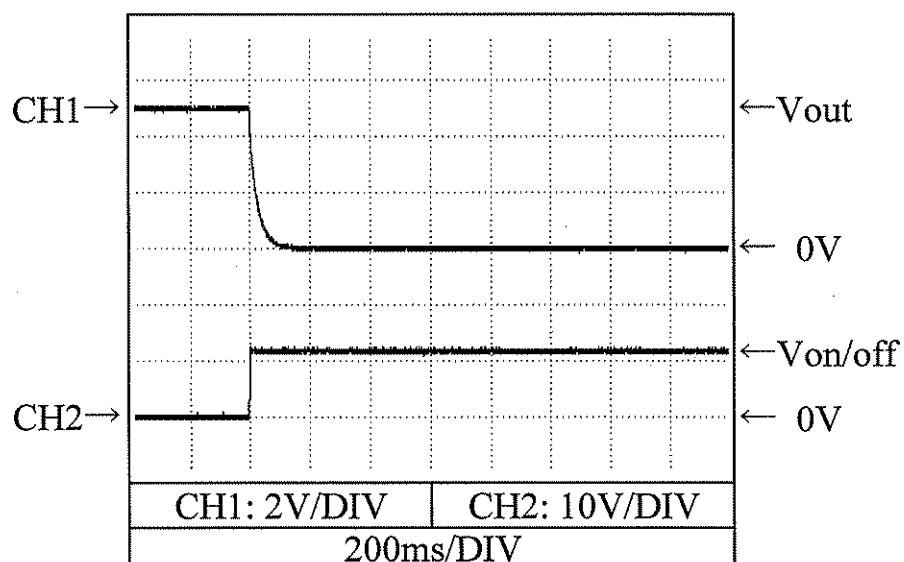
PSS3-48-*

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

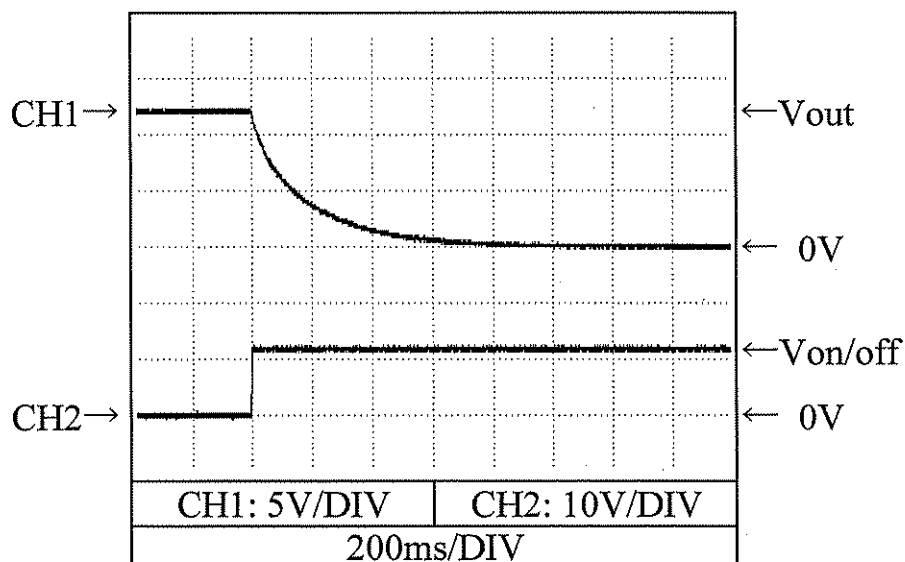
3.3V



5V



12V

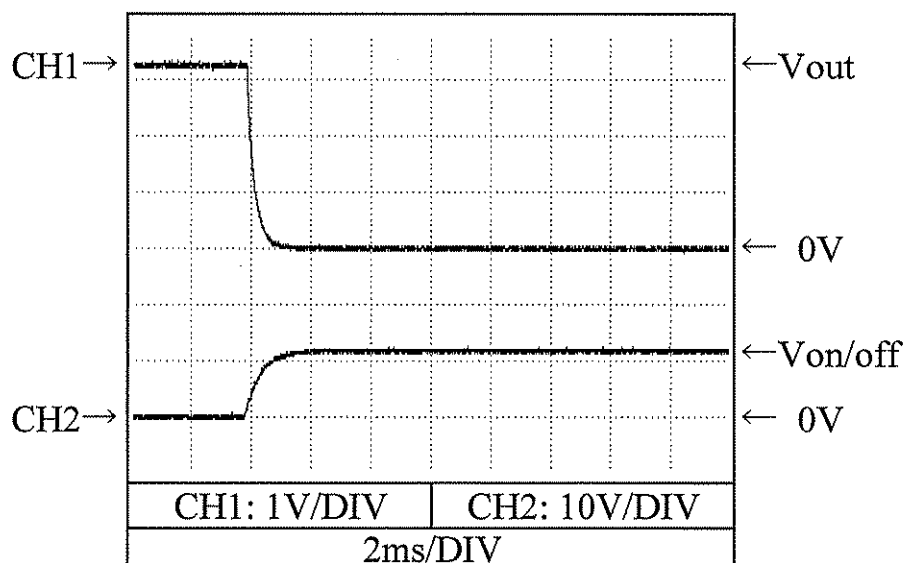


2.7 出力立ち下がり特性 (ON/OFFコントロール時)
Output fall characteristics with ON/OFF CONTROL

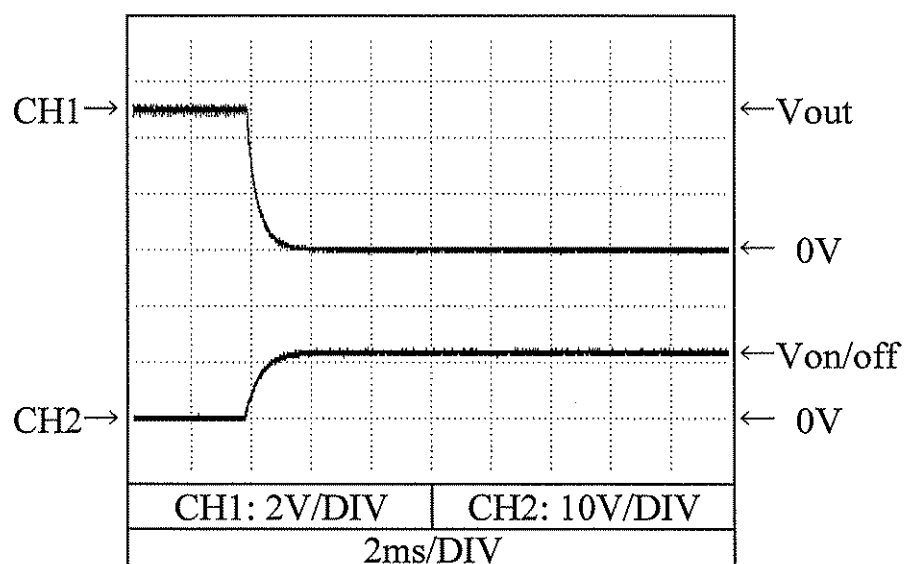
PSS3-48-*

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

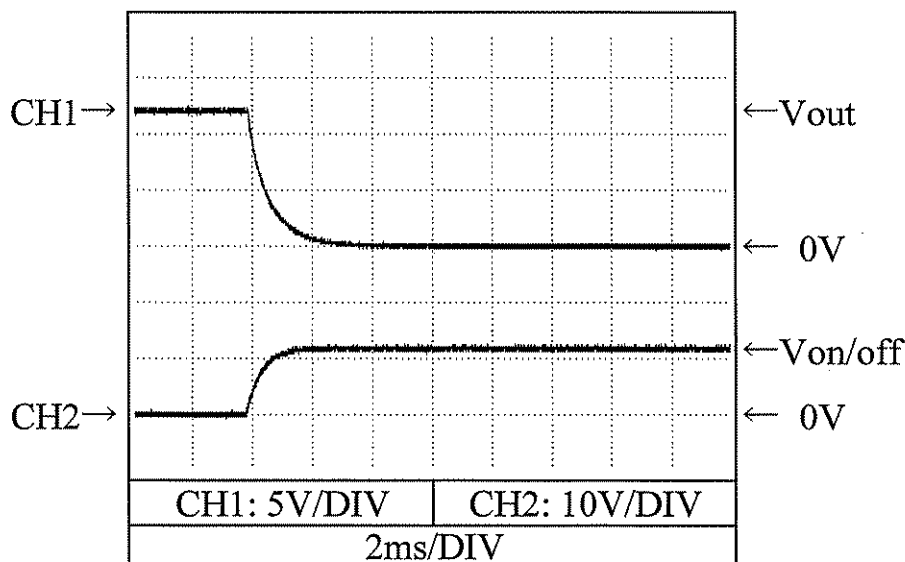
3.3V



5V



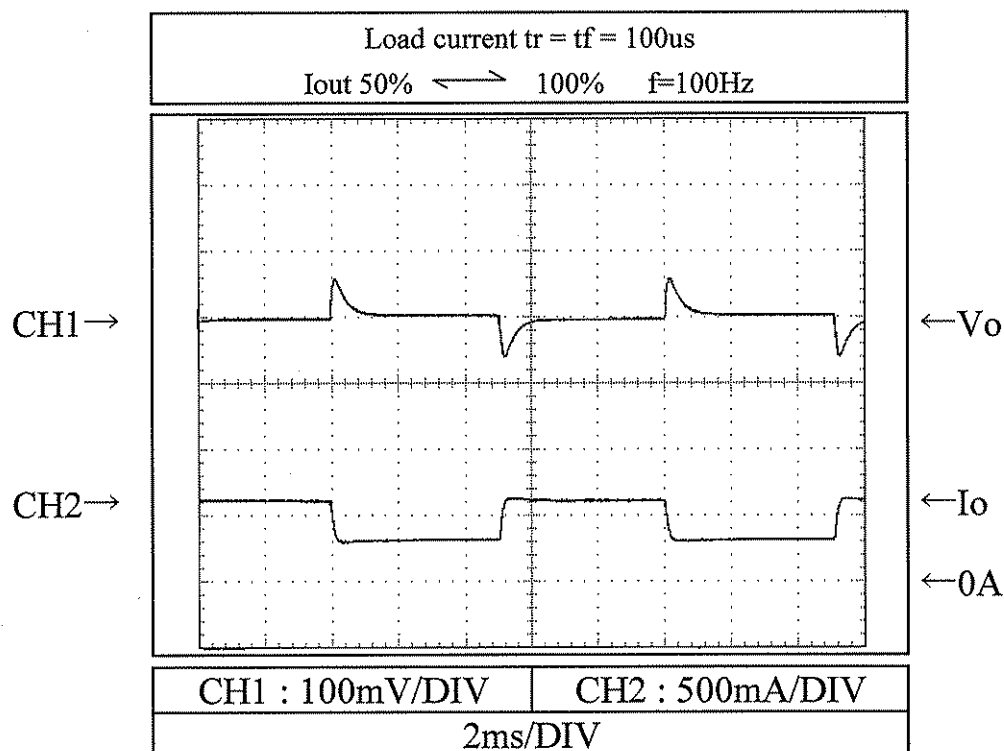
12V



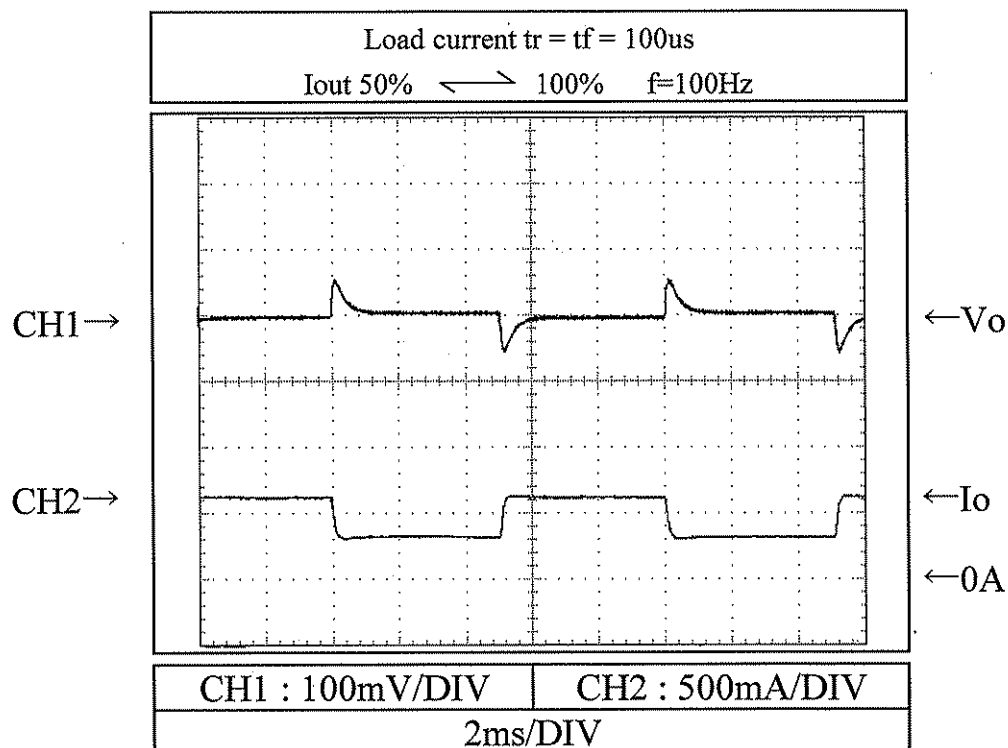
2.8 過渡応答（負荷急変）特性 Dynamic load response characteristics

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

3.3V



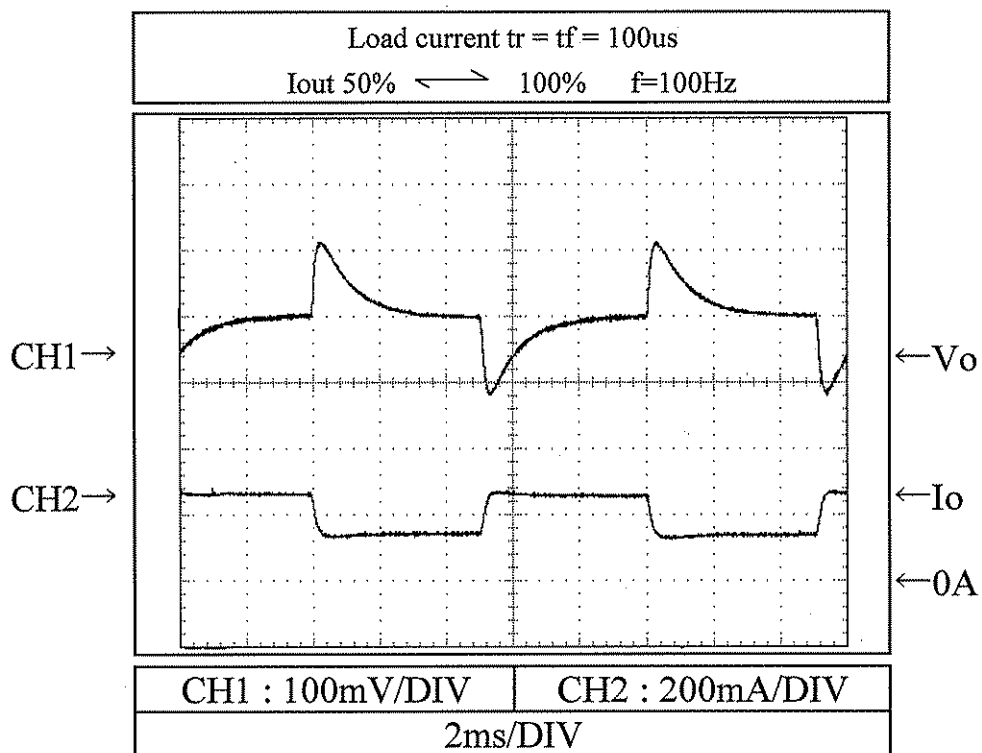
5V



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

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

12V

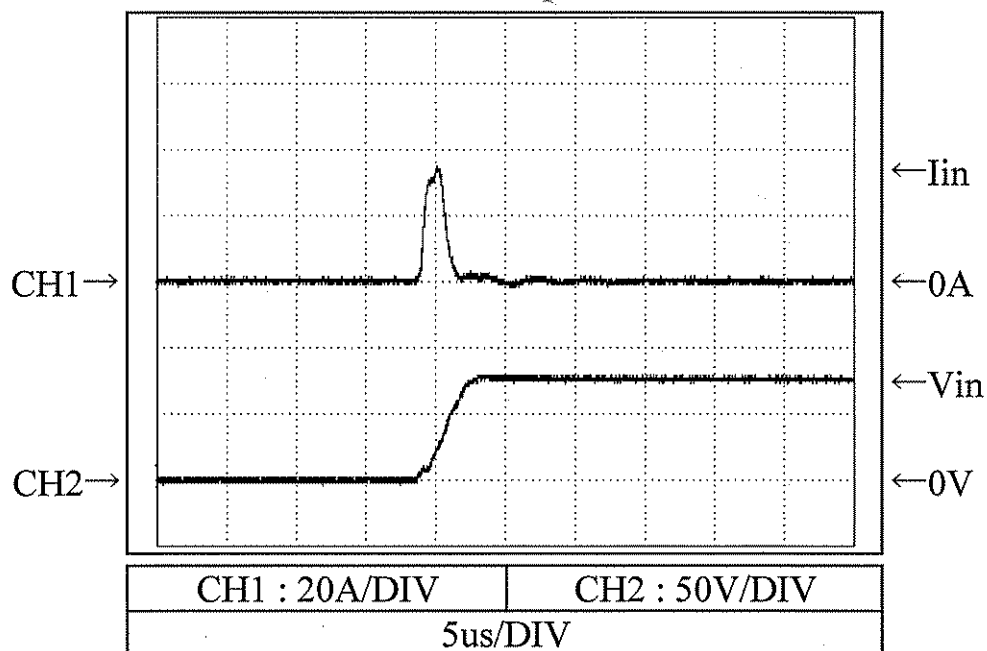


2.9 入力サージ電流（突入電流）特性

Inrush current waveform

Conditions V_{in} : 76 VDC
 I_{out} : 100 %
 T_a : 25 °C

5V



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

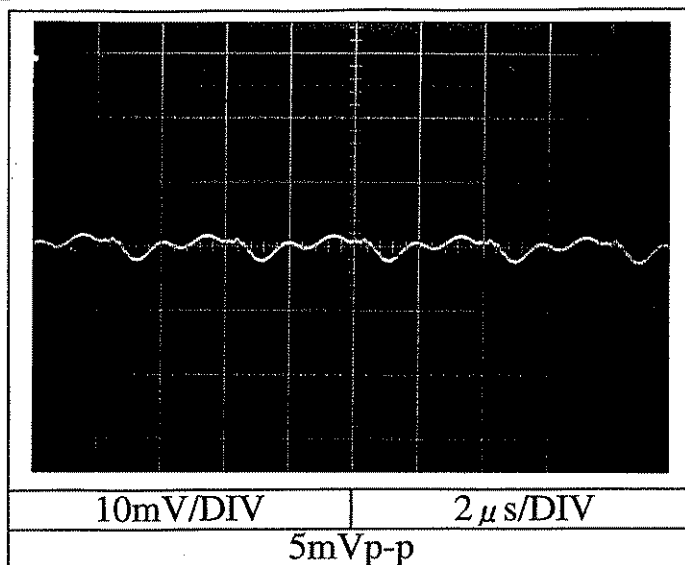
PSS3-48-*

Conditions V_{in} : 48 VDC

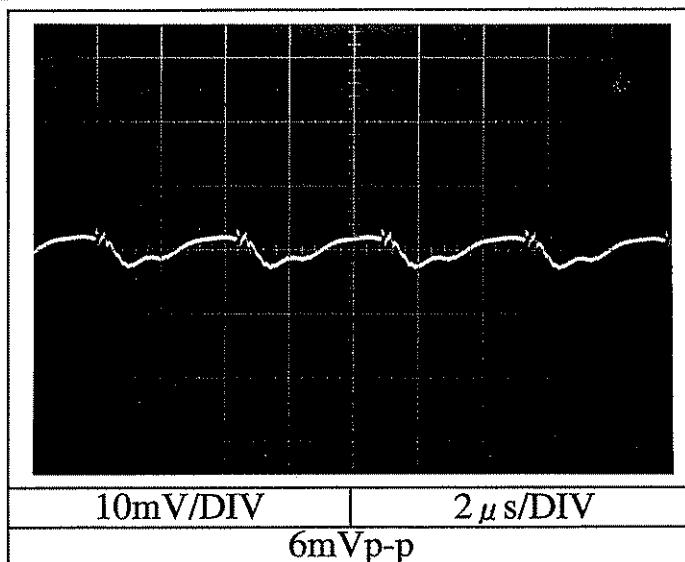
I_{out} : 100 %

T_a : 25 °C

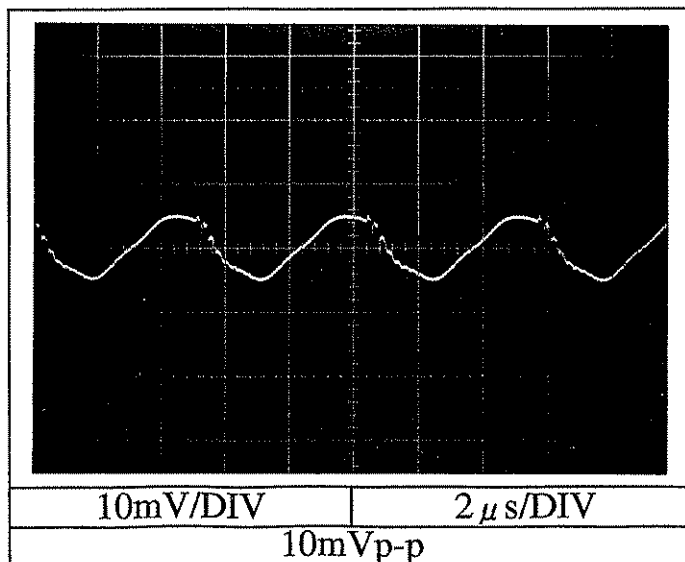
3.3V



5V



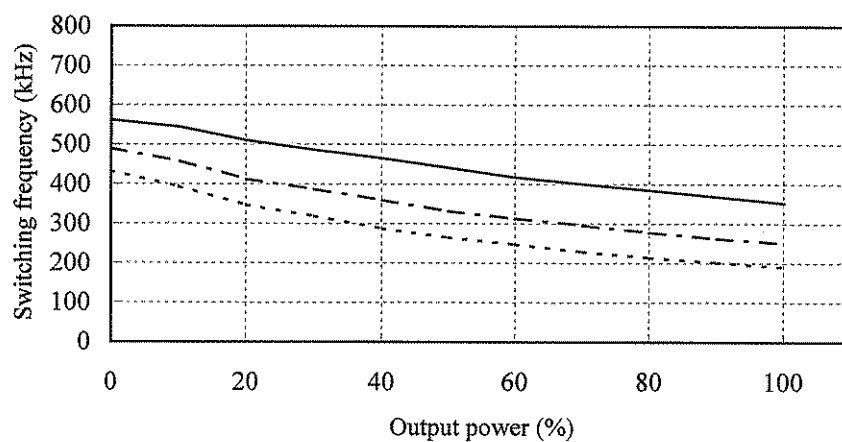
12V



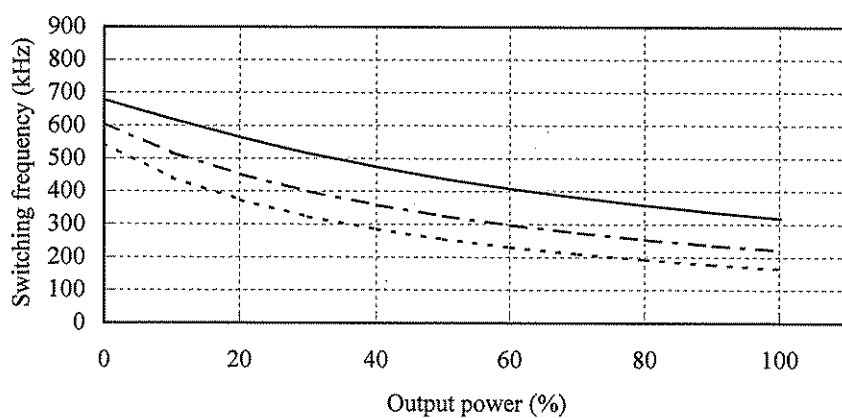
2.11 スイッチング周波数対出力電力
Switching frequency v.s. output power

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

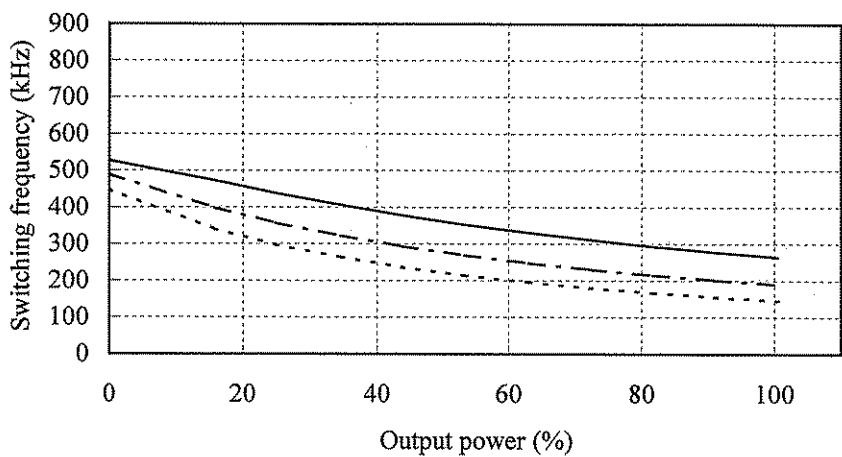
3.3V



5V



12V



2.12 EMI特性

Electro-Magnetic Interference characteristics

(a) 雑音端子電圧 (帰還ノイズ)

Conducted Emission

VCCI class A 対応アプリケーションシステム

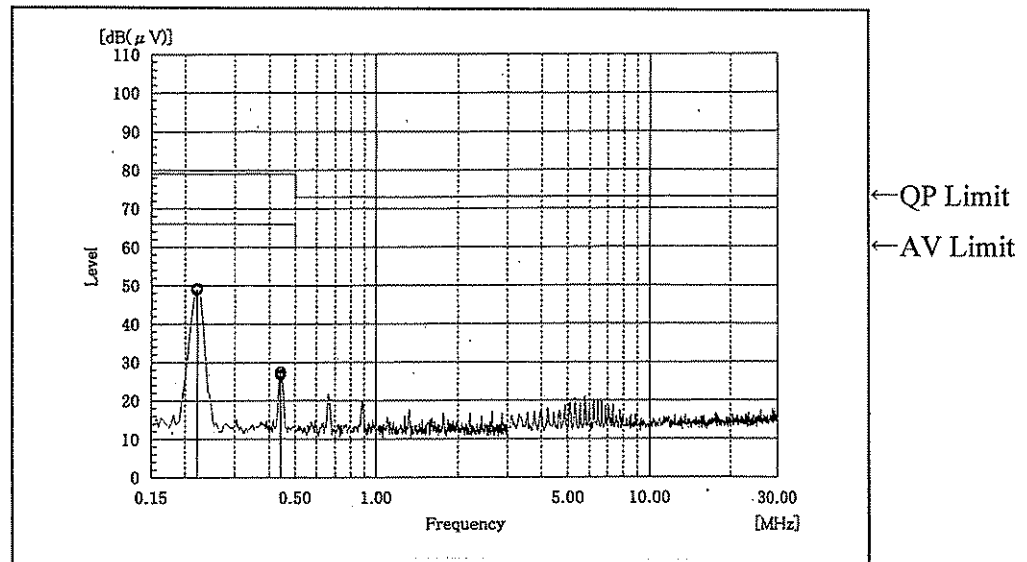
VCCI class A application system

Conditions Vin : 48 VDC

Iout : 100 %

Ta : 25 °C

5V



2.12 EMI特性

Electro-Magnetic Interference characteristics

(b) 雑音電界強度 (輻射ノイズ)

Radiated Emission

VCCI class A 対応アプリケーションシステム

VCCI class A application system

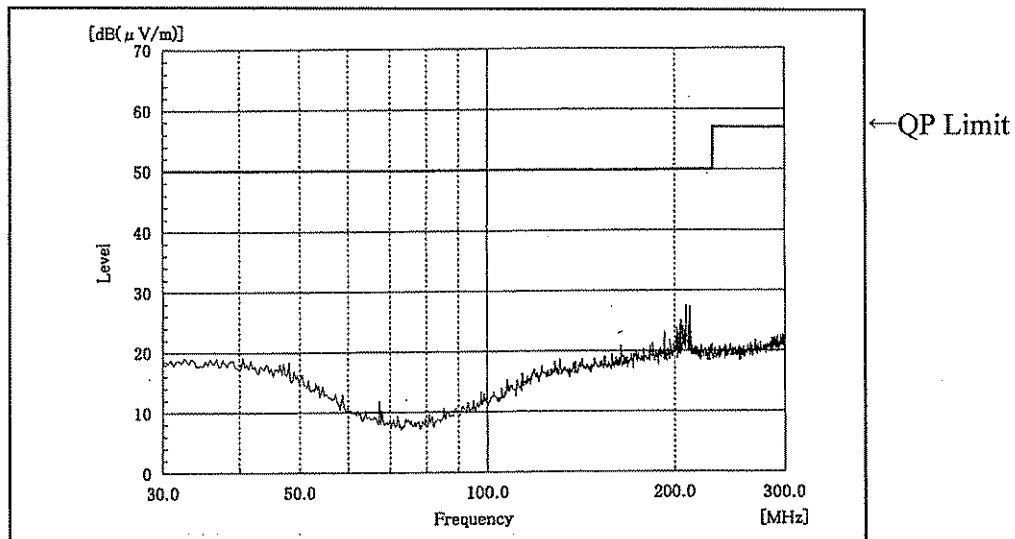
Conditions Vin : 48 VDC

Iout : 100 %

Ta : 25 °C

5V

HORIZONTAL:



VERTICAL:

