

PSS6-5- *

EVALUATION DATA

型式データ

| DWG.No. C188-53-01 | | |
|---------------------------|------------------------------|----------------------------|
| 承認 | 査閲 | 担当 |
| N. Uesono 28. Jan. '05 | S. Koyama 28. Jan. '05 | T. Ohtsuka 28. Jan. '05 |

DENSEI-LAMBDA

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|-----------------------------|---|---------|
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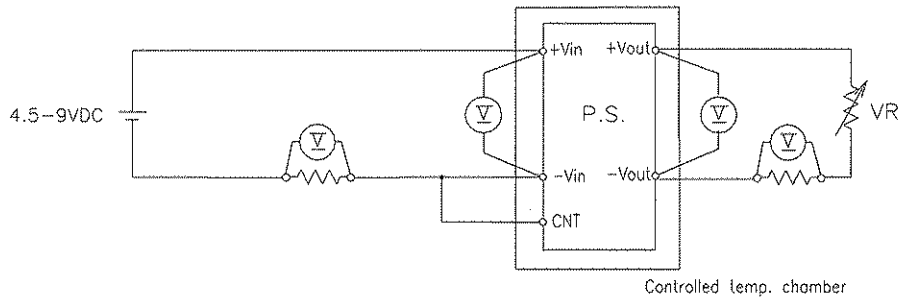
使用記号 Terminology used

| | 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 |

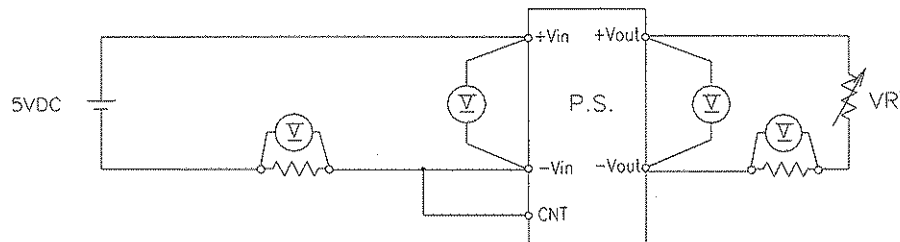
1. 測定方法 Evaluation Method

1.1 測定回路 Circuits used for determination

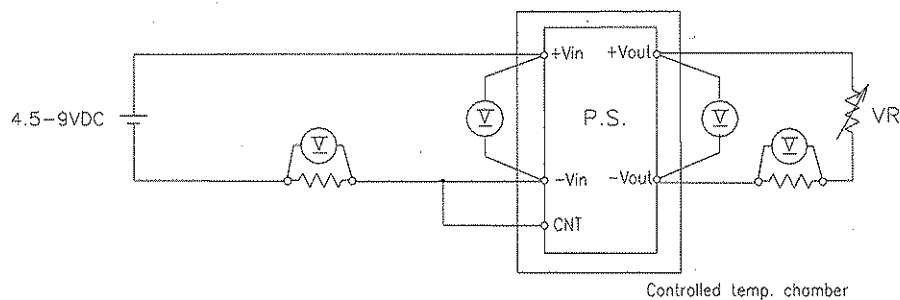
(1) 静特性 Steady state data



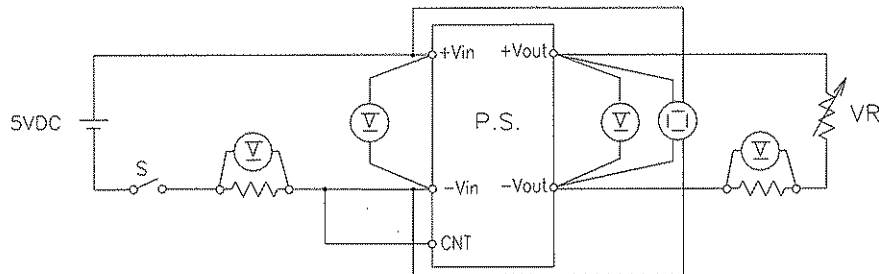
(2) 通電ドリフト特性 Warm up voltage drift characteristics



(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



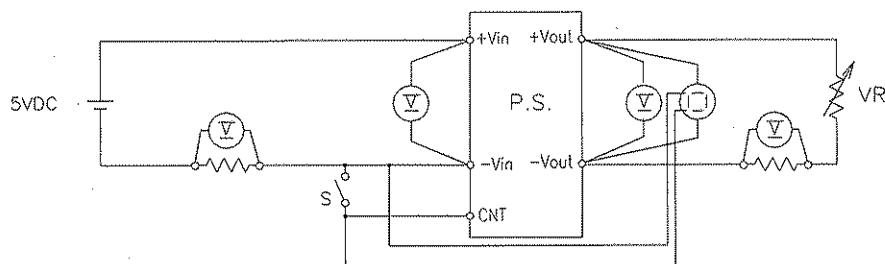
(5) 出力立ち下がり特性 Output fall characteristics

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



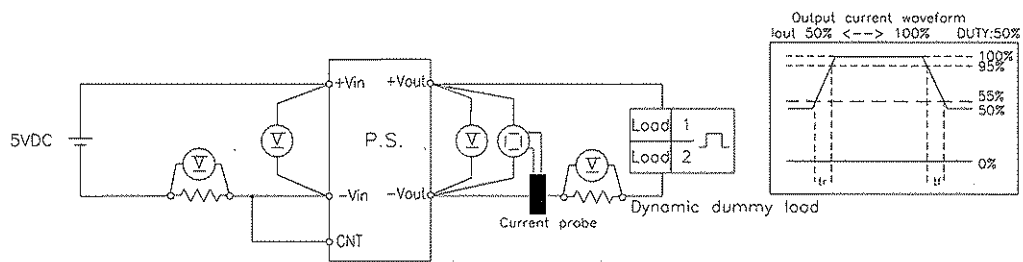
(7) 出力立ち下がり特性 (ON/OFFコントロール時)

Output fall characteristics with CONTROL ON/OFF

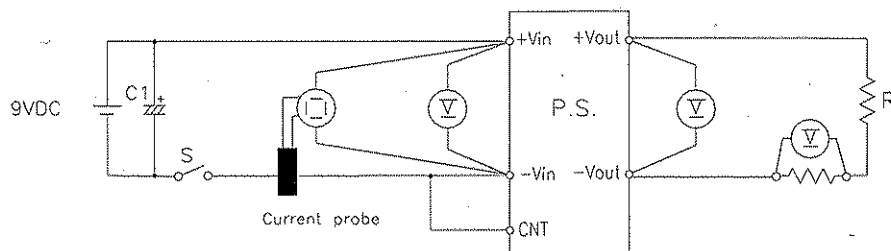
出力立ち上がり特性 (ON/OFFコントロール時) と同じ

Same as output rise characteristics with CONTROL ON/OFF

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

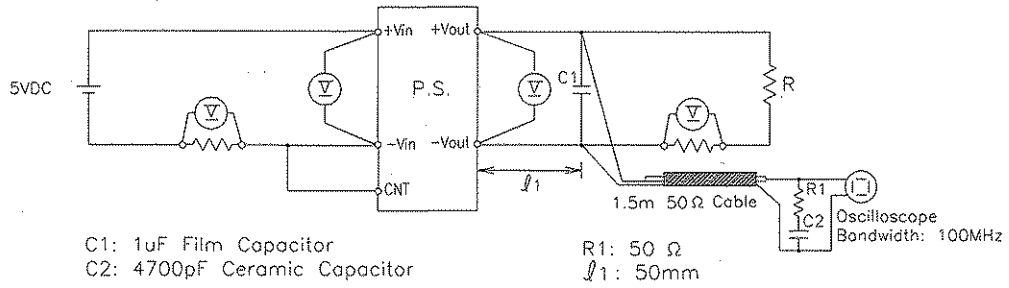


(9) 入力サージ電流 (突入電流) 特性 Inrush current characteristics

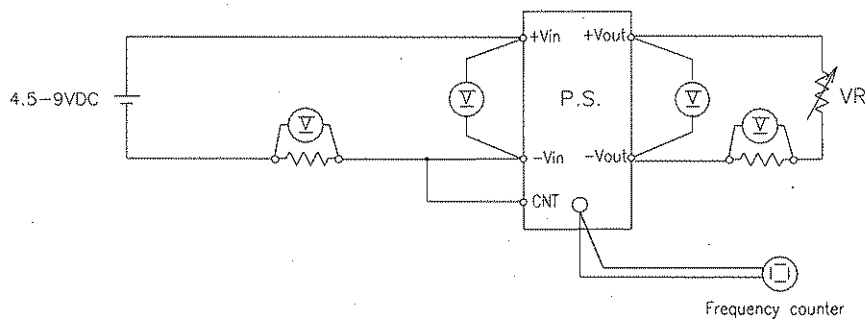


C1: 4000uF Electrolytic Capacitor

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

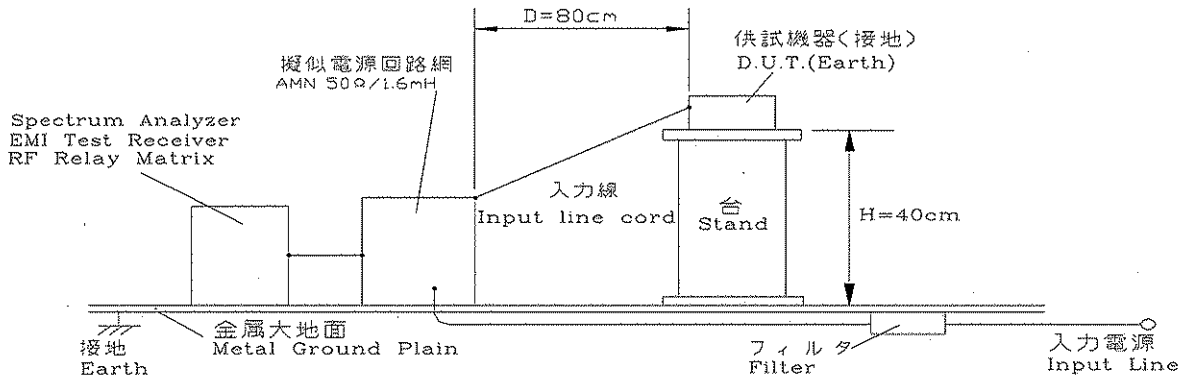


(11) スイッチング周波数対出力電力 Switching frequency v.s. output power

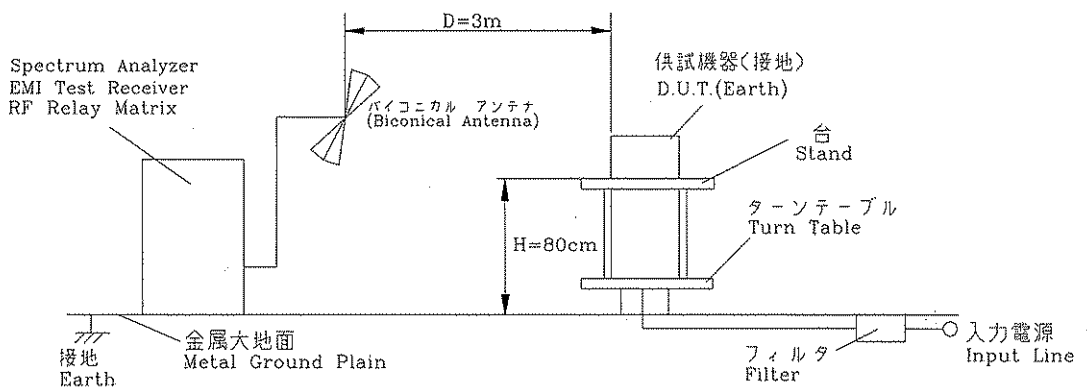


(12) EMI 特性 Electro-Magnetic Interference characteristics

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

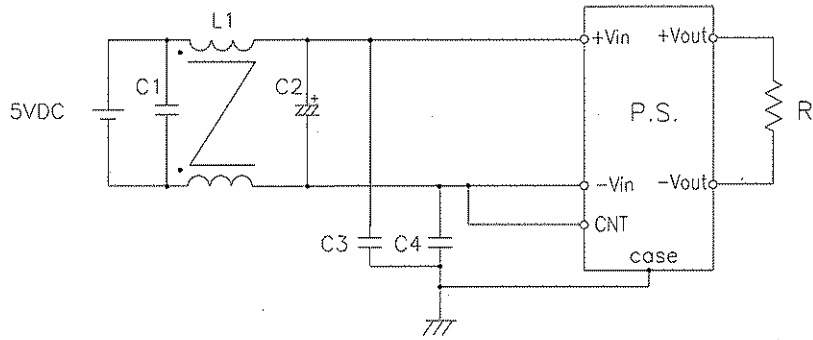


(b) 雑音電界強度 (輻射ノイズ) Radiated Emission Noise



(1) VCCI class A 対応アプリケーションシステム

VCCI class A application system



L1: 0.2mH
 C1: 10uF Chip Ceramic Capacitor
 C2: 470uF Electrolytic Capacitor
 C3,C4 : 4700pF Ceramic Capacitor

1.2 使用測定機器 List of equipment used

| | EQUIPMENT USED | MANUFACTURER | MODEL NO. |
|----|------------------------------|---------------------------|--------------|
| 1 | OSCILLO SCOPE | HITACHI DENSHI | V-1565 |
| 2 | DIGITAL STORAGE OSCILLOSCOPE | TEKTRONIX | TDS 540D |
| 3 | DIGITAL MULTIMETER | AGILENT | 34970A |
| 4 | CURRENT PROBE/AMPLIFIER | TEKTRONIX | A6303/TM502A |
| 5 | SHUNT RESISTER | YOKOGAWA ELECT. | 2215 |
| 6 | DYNAMIC DUMMY LOAD | TAKASAGO | FK-400L |
| 7 | INPUT POWER SUPPLY | KIKUSUI ELECTRONICS CORP. | PAD 110-10L |
| 8 | CONTROLLED TEMP. CHAMBER | TABAI ESPEC | SH-240 |
| 9 | SPECTRUM ANALYZER | ROHDE & SCHWARZ | FSA |
| 10 | EMI TEST RECEIVER | ROHDE & SCHWARZ | ESHS10 |
| 11 | EMI TEST RECEIVER | ROHDE & SCHWARZ | ESVS10 |
| 12 | RF RELAY MATRIX | ROHDE & SCHWARZ | PSU |
| 13 | AMN | KYORITU DENSHI | KNW-242 |
| 14 | 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 | 4.5VDC | 5VDC | 9VDC | line regulation | |
|------------|--------|--------|--------|-----------------|--------|
| 0% | 3.238V | 3.238V | 3.239V | 1.0mV | 0.031% |
| 50% | 3.237V | 3.237V | 3.237V | 0.0mV | 0.000% |
| 100% | 3.236V | 3.236V | 3.236V | 0.0mV | 0.000% |
| load | 2.0mV | 2.0mV | 3.0mV | | |
| regulation | 0.06% | 0.06% | 0.09% | | |

2. Temperature drift

Conditions Vin : 5VDC

Iout : 100%

| Ta | -40°C | 25°C | 85°C | temperature stability | |
|------|--------|--------|--------|-----------------------|-------|
| Vout | 3.214V | 3.236V | 3.240V | 26.0mV | 0.80% |

5V

1. Regulation - line and load

Condition Ta : 25°C

| Iout \ Vin | 4.5VDC | 5VDC | 9VDC | line regulation | |
|------------|--------|--------|--------|-----------------|--------|
| 0% | 5.010V | 5.010V | 5.011V | 1.0mV | 0.020% |
| 50% | 5.009V | 5.010V | 5.010V | 1.0mV | 0.020% |
| 100% | 5.008V | 5.008V | 5.009V | 1.0mV | 0.020% |
| load | 2.0mV | 2.0mV | 2.0mV | | |
| regulation | 0.04% | 0.04% | 0.04% | | |

2. Temperature drift

Conditions Vin : 5VDC

Iout : 100%

| Ta | -40°C | 25°C | 85°C | temperature stability | |
|------|--------|--------|--------|-----------------------|-------|
| Vout | 4.987V | 5.008V | 5.008V | 21.0mV | 0.42% |

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 | 4.5VDC | 5VDC | 9VDC | line regulation | |
|-----------------|---------|---------|---------|-----------------|--------|
| 0% | 12.056V | 12.057V | 12.057V | 1.0mV | 0.008% |
| 50% | 12.056V | 12.057V | 12.057V | 1.0mV | 0.008% |
| 100% | 12.055V | 12.056V | 12.056V | 1.0mV | 0.008% |
| load regulation | 1.0mV | 1.0mV | 1.0mV | | |
| | 0.01% | 0.01% | 0.01% | | |

2. Temperature drift

Conditions Vin : 5VDC

Iout : 100%

| Ta | -40°C | 25°C | 85°C | temperature stability | |
|------|---------|---------|---------|-----------------------|-------|
| Vout | 12.013V | 12.056V | 12.055V | 43.0mV | 0.36% |

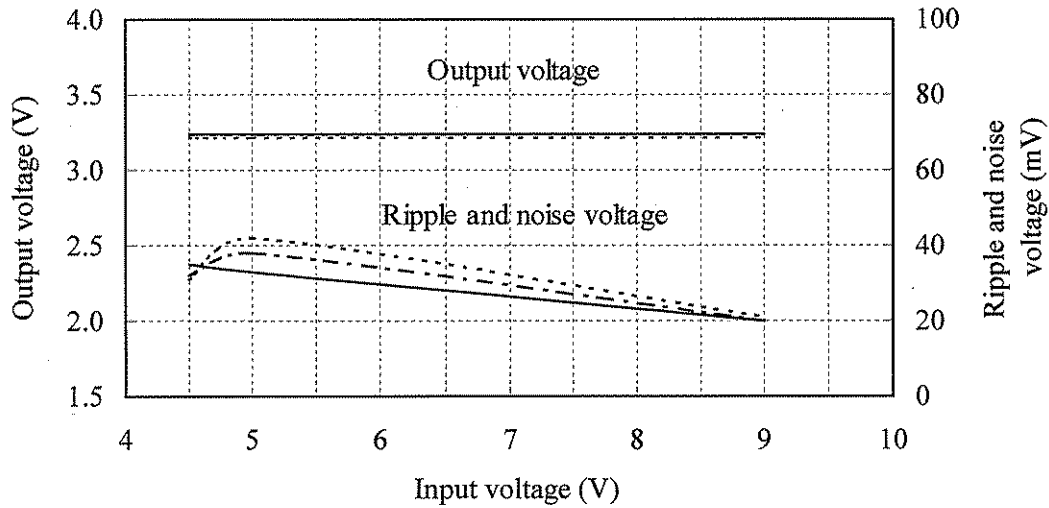
2.1 (2) 出力電圧・リップル電圧対入力電圧

Output voltage and ripple voltage v.s. input voltage

Conditions Iout : 100 %

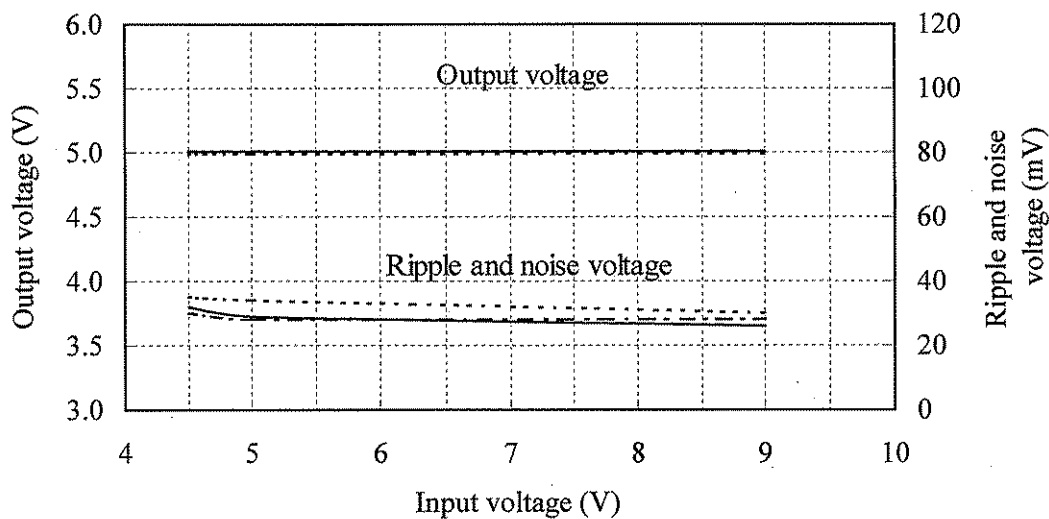
Ta : -40 °C -----
 25 °C -----
 85 °C -----

3.3V



Ta : -40 °C -----
 25 °C -----
 85 °C -----

5V

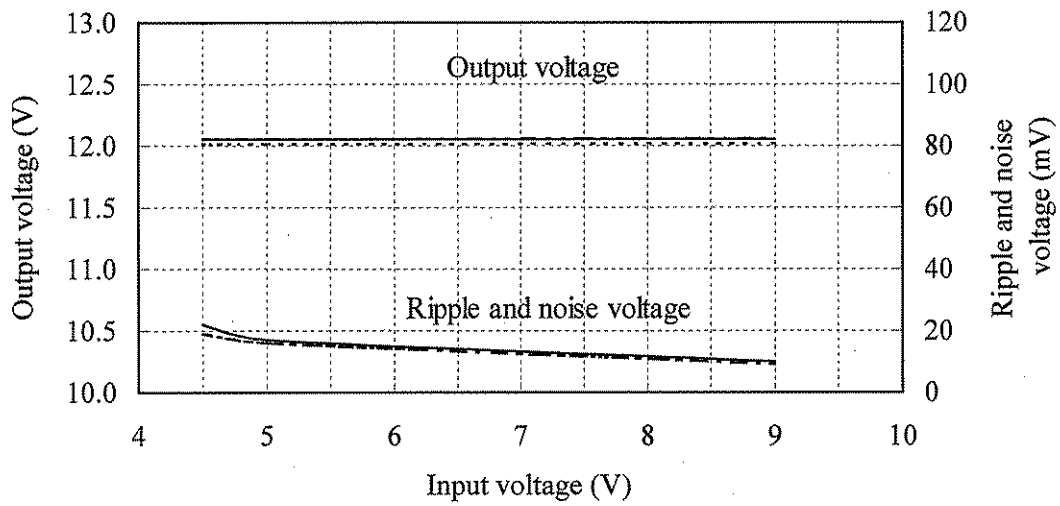


2.1 (2) 出力電圧・リップル電圧対入力電圧
Output voltage and ripple voltage v.s. input voltage

Conditions Iout : 100 %

Ta : -40 °C -----
 25 °C -----
 85 °C -----

12V

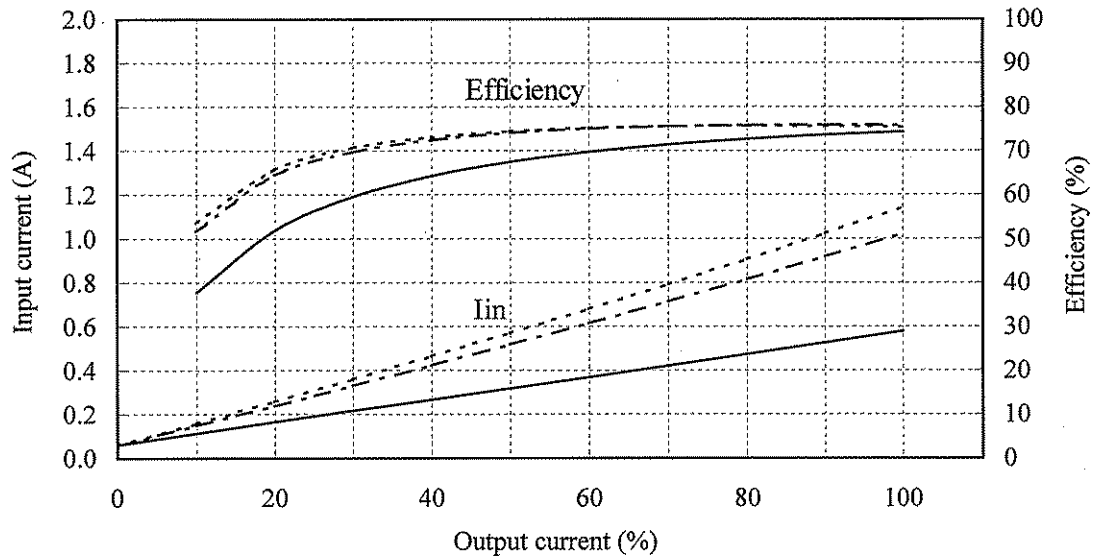


2.1 (3) 効率・入力電流対出力電流

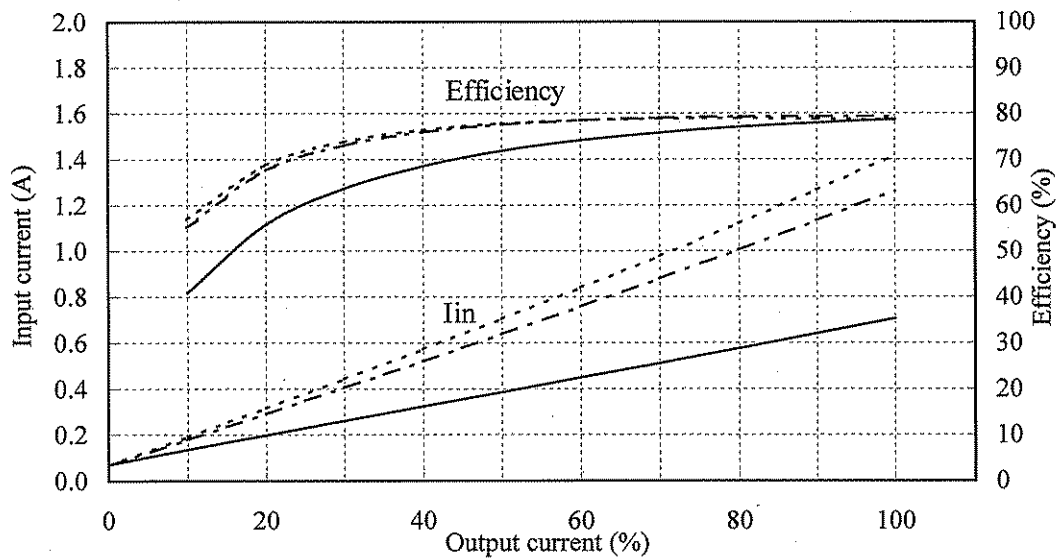
Efficiency and input current v.s. output current

Conditions V_{in} : 4.5 VDC -----
 : 5 VDC - - - - -
 : 9 VDC ————
 T_a : 25 °C

3.3V



5V

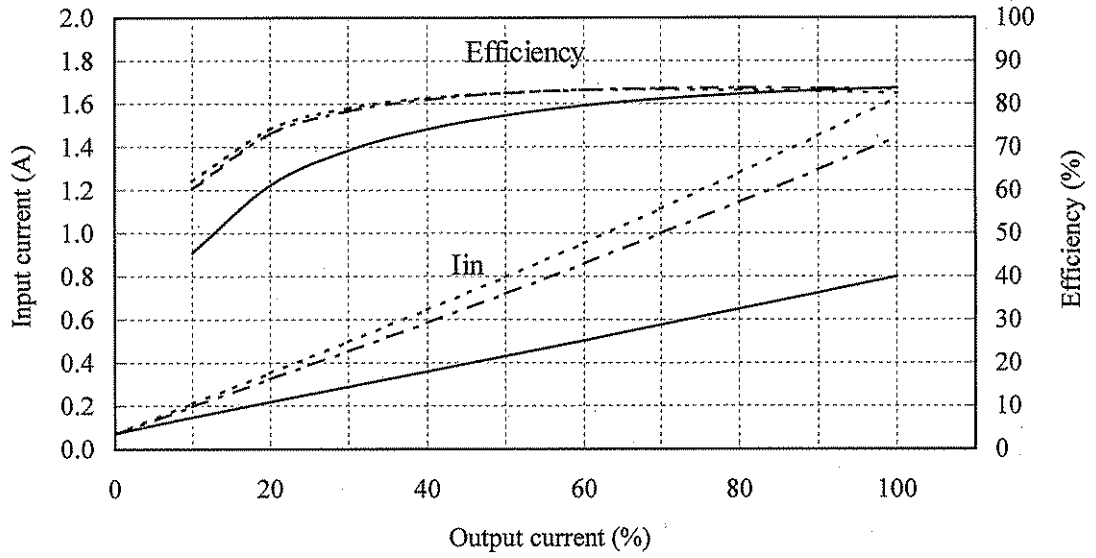


2.1 (3) 効率・入力電流対出力電流

Efficiency and input current v.s. output current

Conditions V_{in} : 4.5 VDC -----
 : 5 VDC - - - - -
 : 9 VDC ————
 T_a : 25 °C

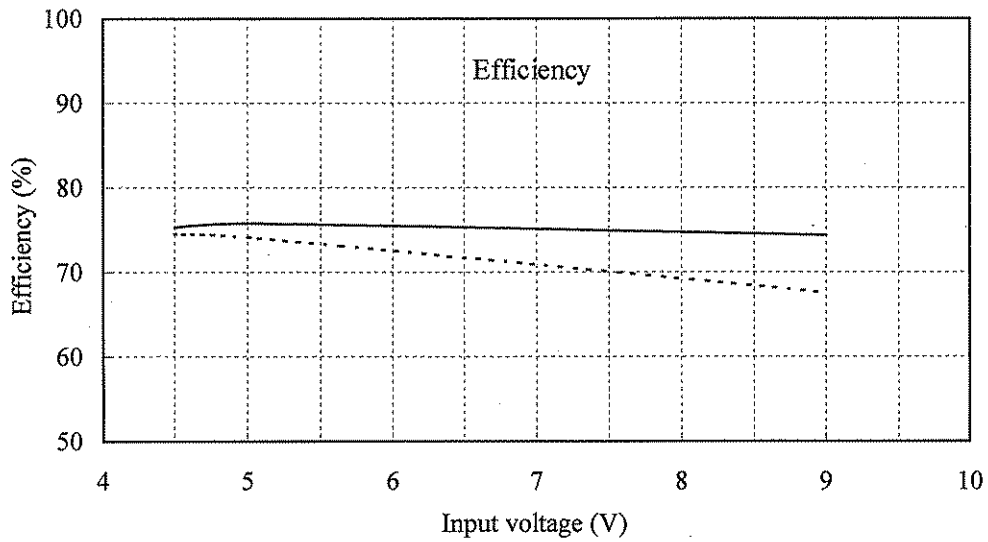
12V



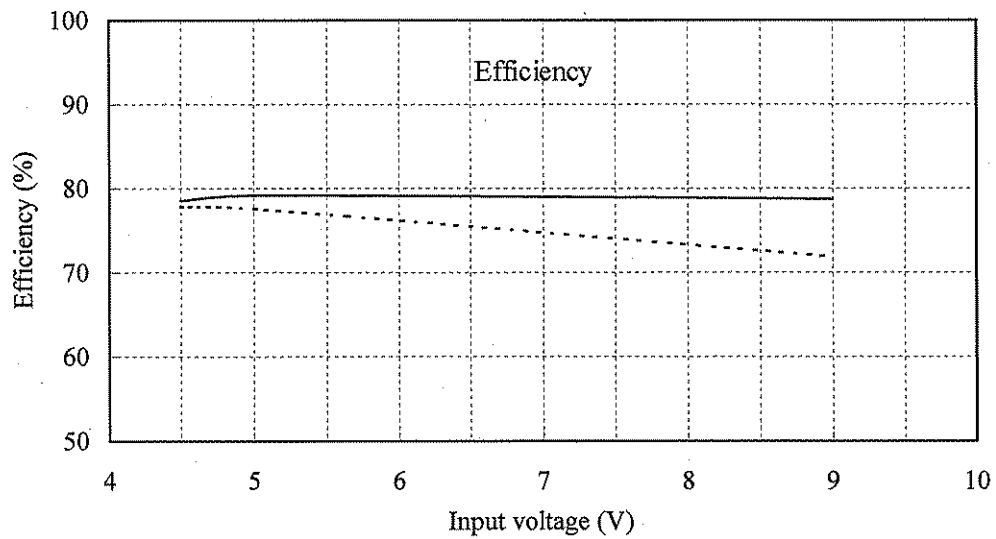
2.1 (4) 効率対入力電圧
Efficiency v.s. input voltage

Conditions Ta : 25 °C
Iout : 50 % -----
100 % —————

3.3V



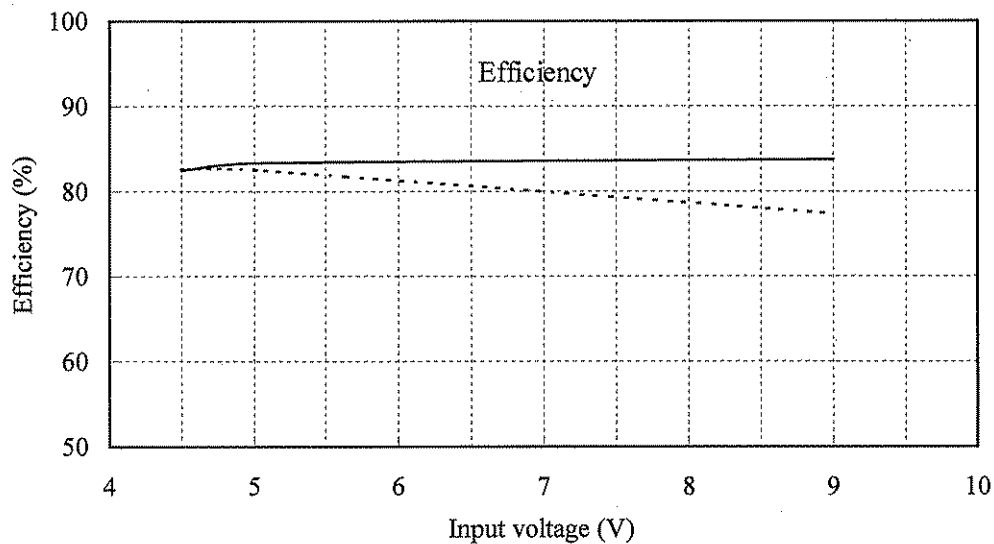
5V



2.1 (4) 効率対入力電圧
Efficiency v.s. input voltage

Conditions Ta : 25 °C
Iout : 50 % -----
100 % —————

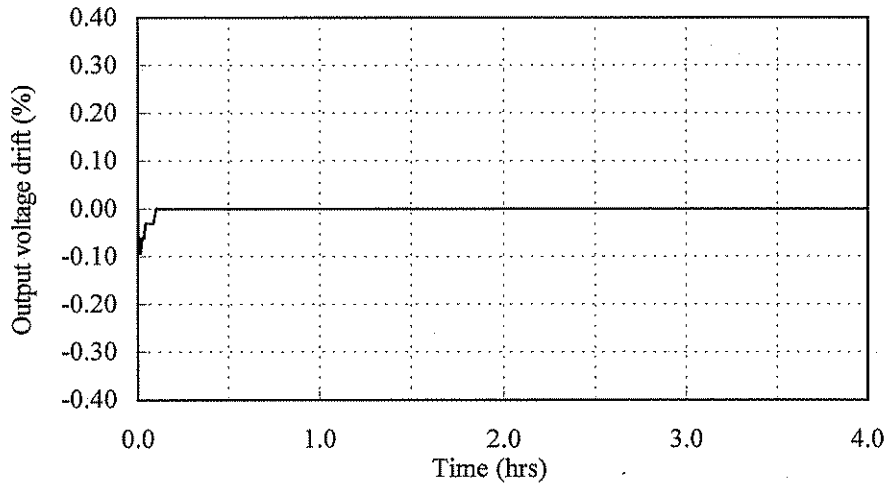
12V



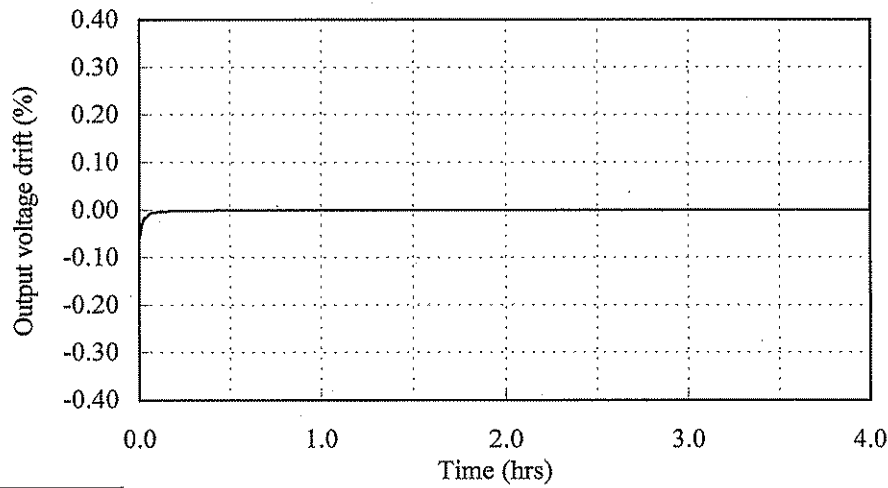
2.2 通電ドリフト特性
Warm up voltage drift characteristics

Conditions V_{in} : 5 VDC
 I_{out} : 100 %
 T_a : 25 °C

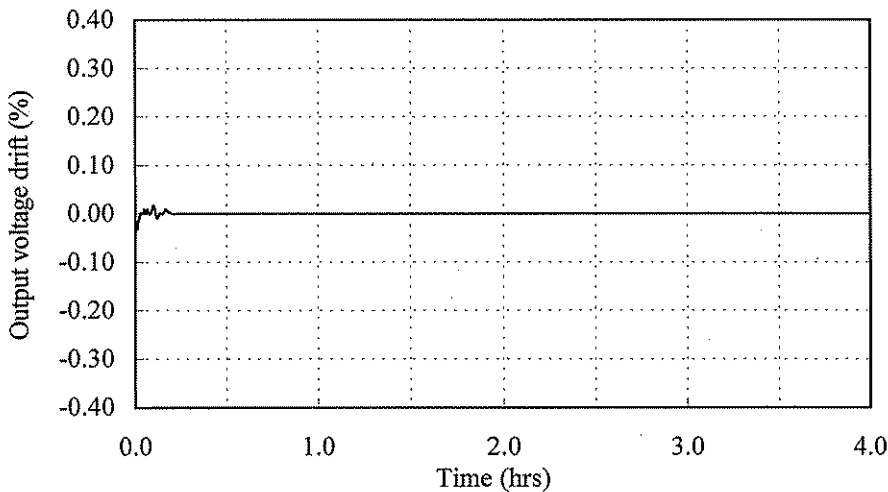
3.3V



5V



12V



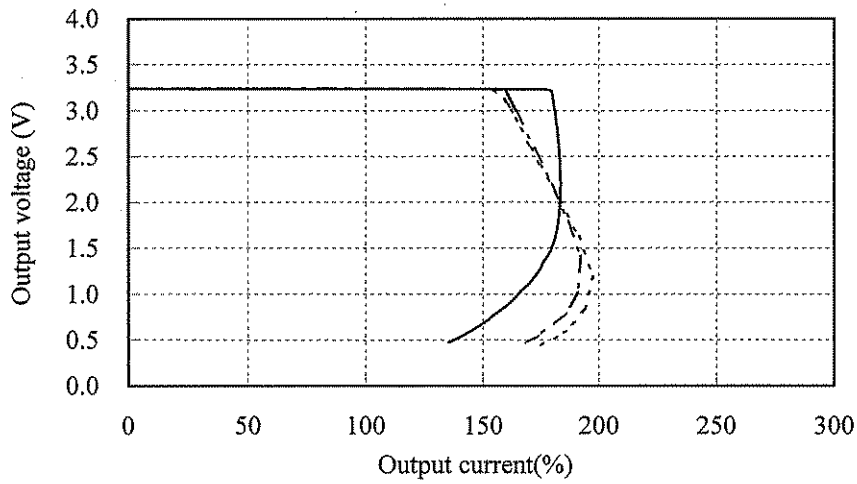
2.3 過電流保護特性

Over current protection (OCP) characteristics

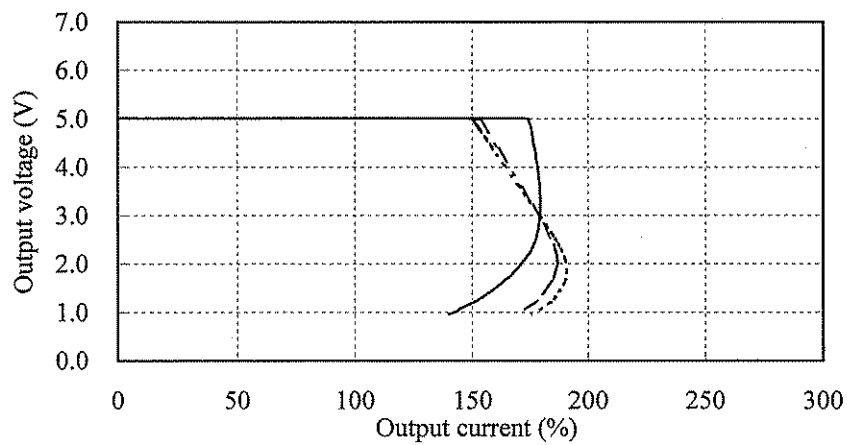
Conditions V_{in} : 4.5 VDC -----
 5 VDC - - - - -
 9 VDC ————

T_a : 25 °C

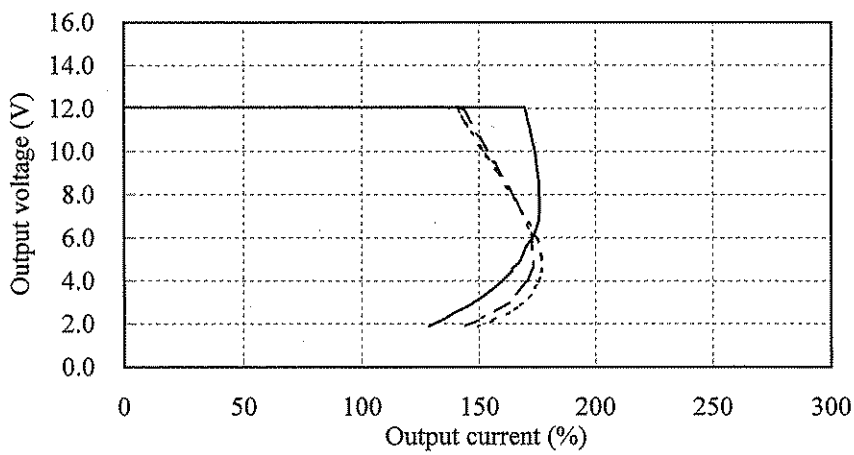
3.3V



5V



12V



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

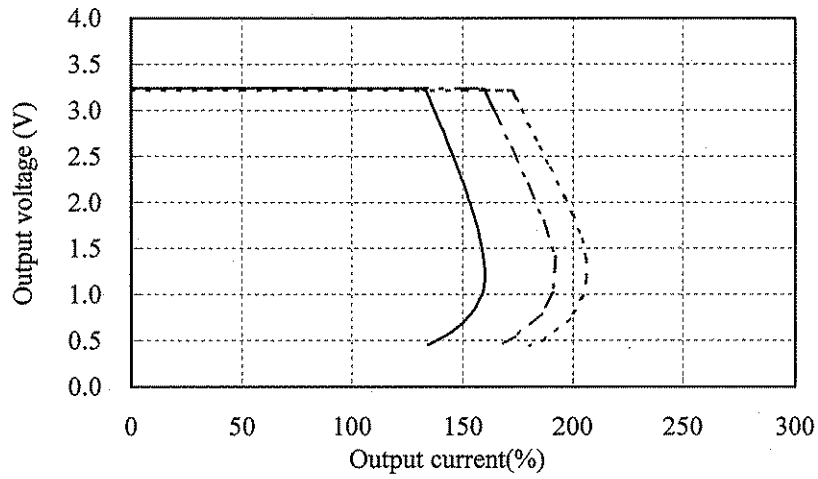
Conditions V_{in} : 5 VDC

T_a : -40 °C -----

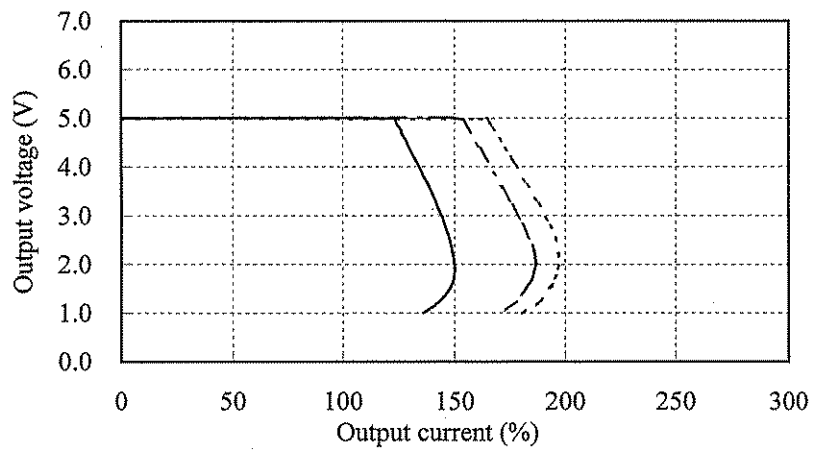
25 °C - - - - -

85 °C _____

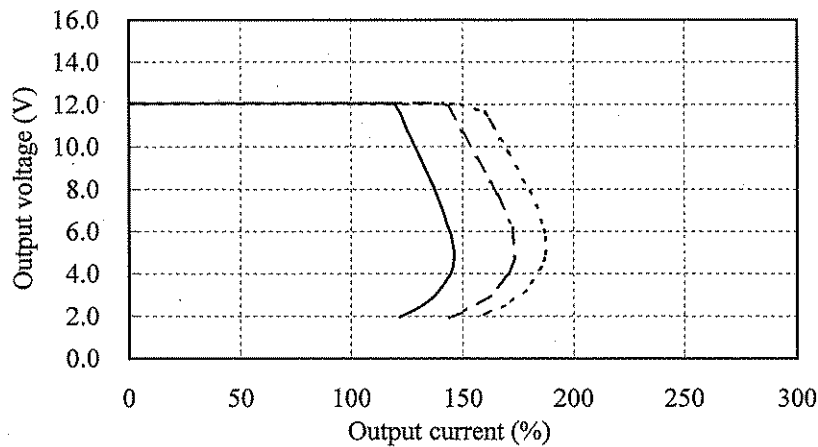
3.3V



5V



12V

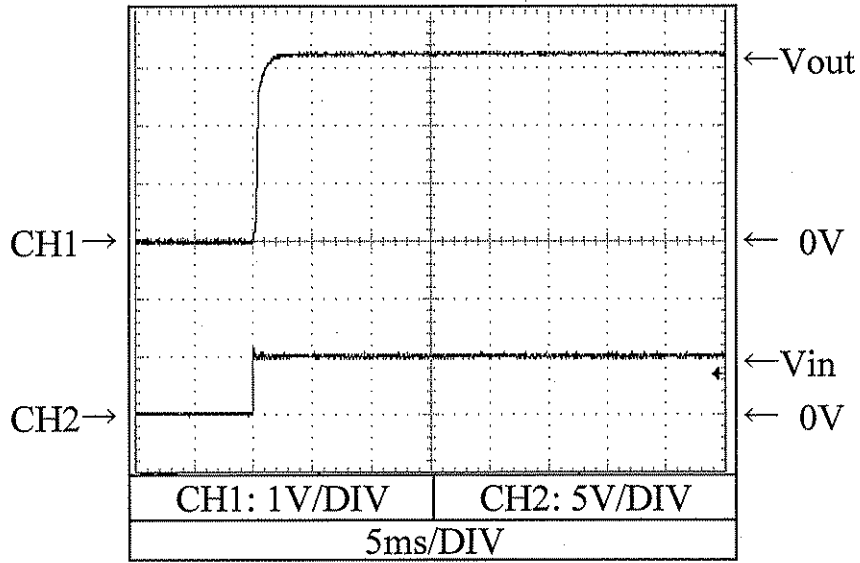


2.4 出力立ち上がり特性
Output rise characteristics

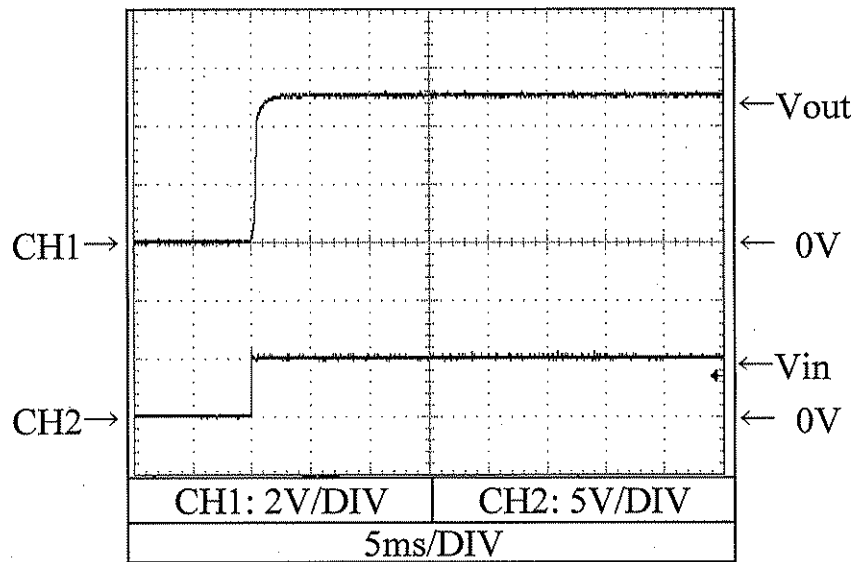
PSS6-5-*

Conditions V_{in} : 5 VDC
 I_{out} : 0 %
 T_a : 25 °C

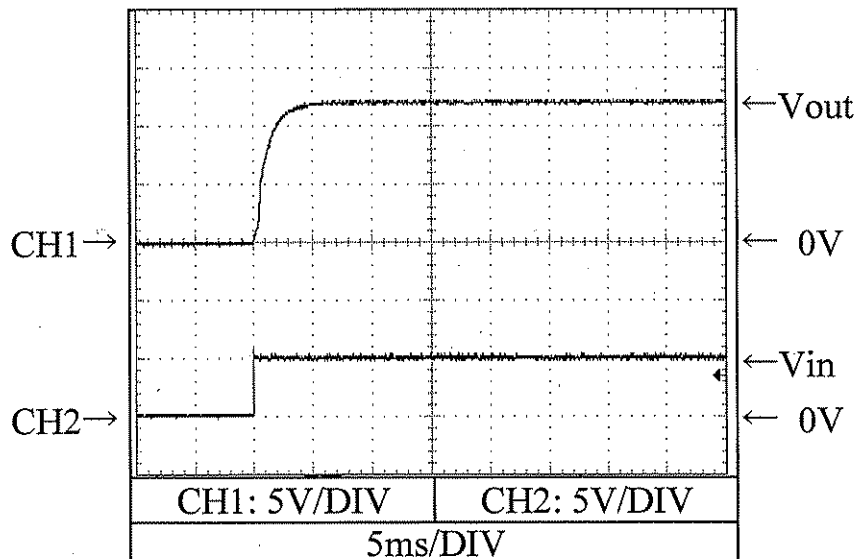
3.3V



5V



12V

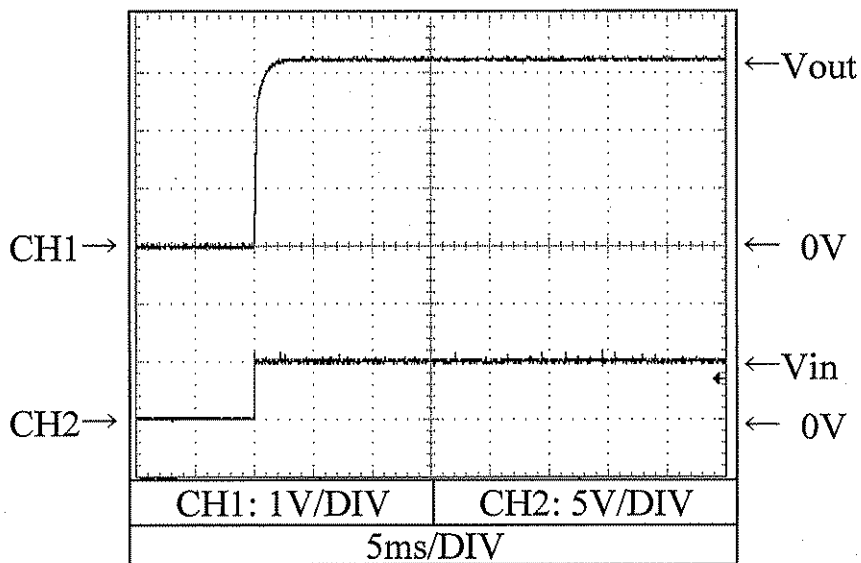


2.4 出力立ち上がり特性
Output rise characteristics

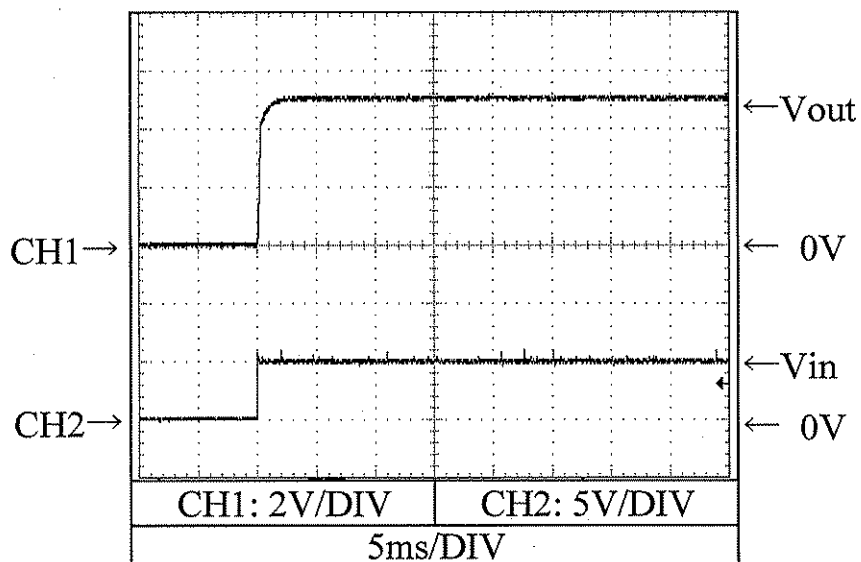
PSS6-5-*

Conditions V_{in} : 5 VDC
 I_{out} : 100 %
 T_a : 25 °C

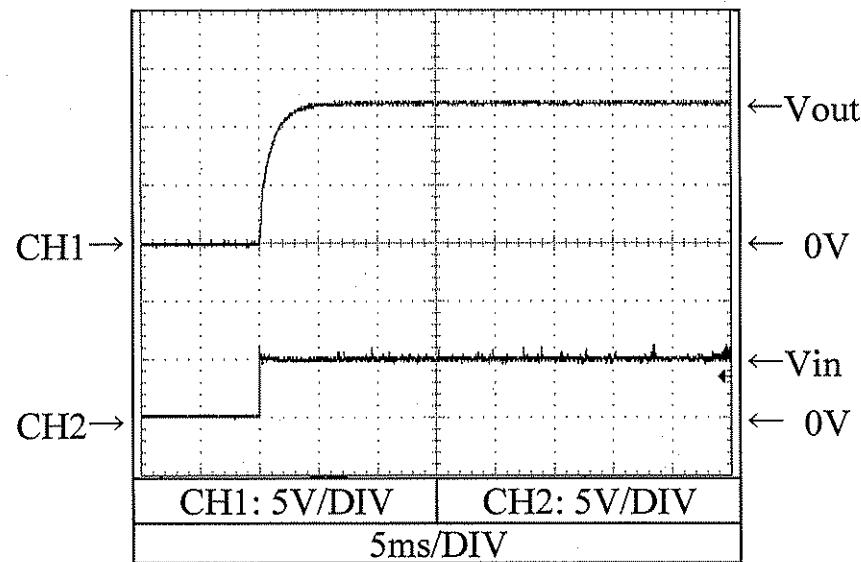
3.3V



5V



12V

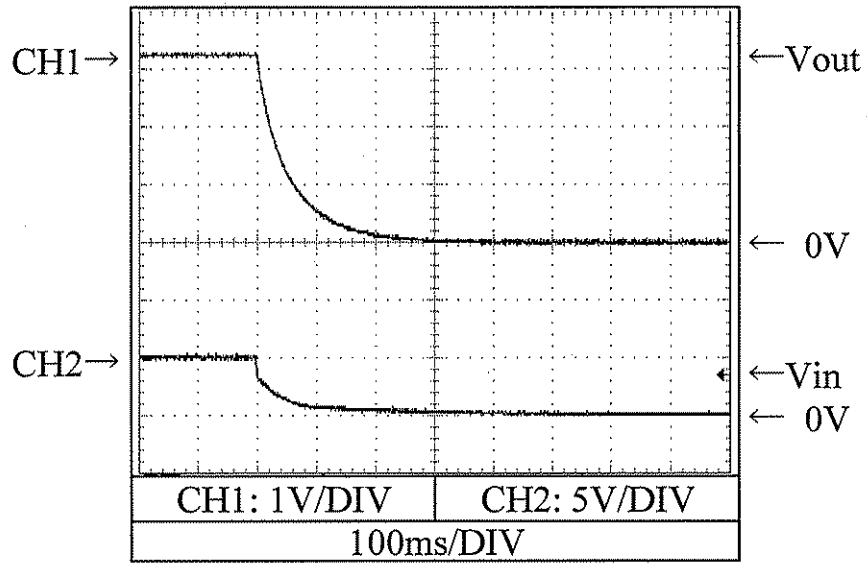


2.5 出力立ち下がり特性
Output fall characteristics

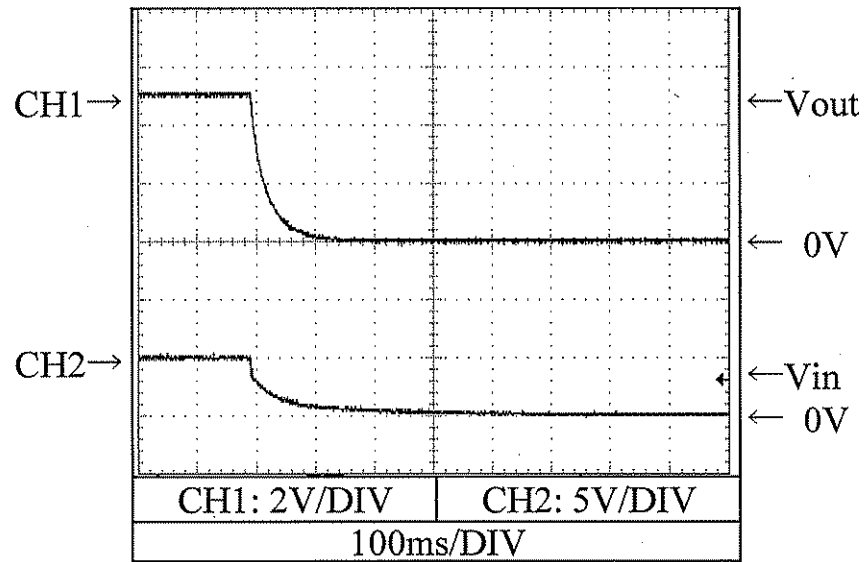
PSS6-5-*

Conditions Vin : 5 VDC
Iout : 0 %
Ta : 25 °C

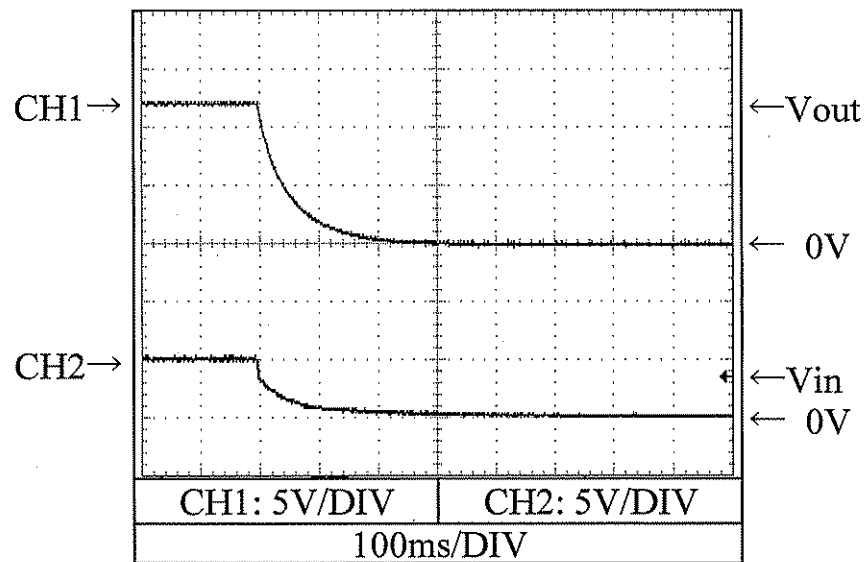
3.3V



5V



12V

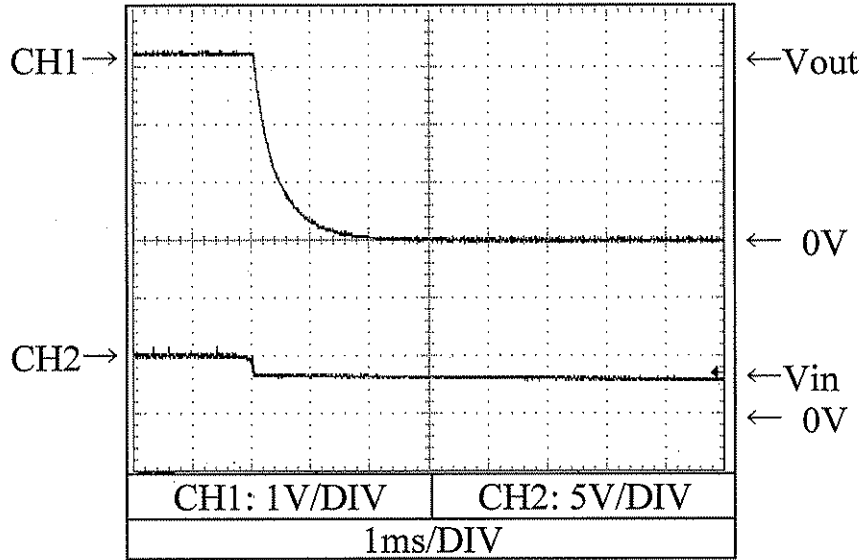


2.5 出力立ち下がり特性
Output fall characteristics

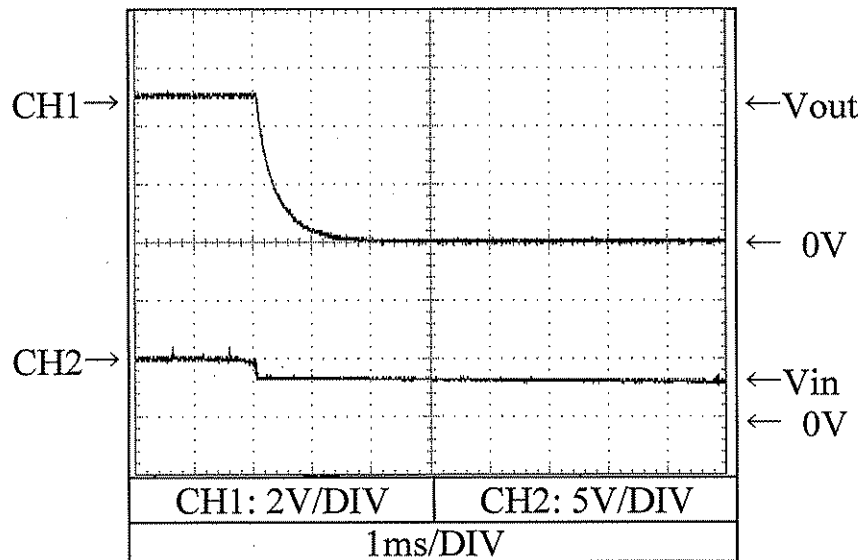
PSS6-5-*

Conditions Vin : 5 VDC
Iout : 100 %
Ta : 25 °C

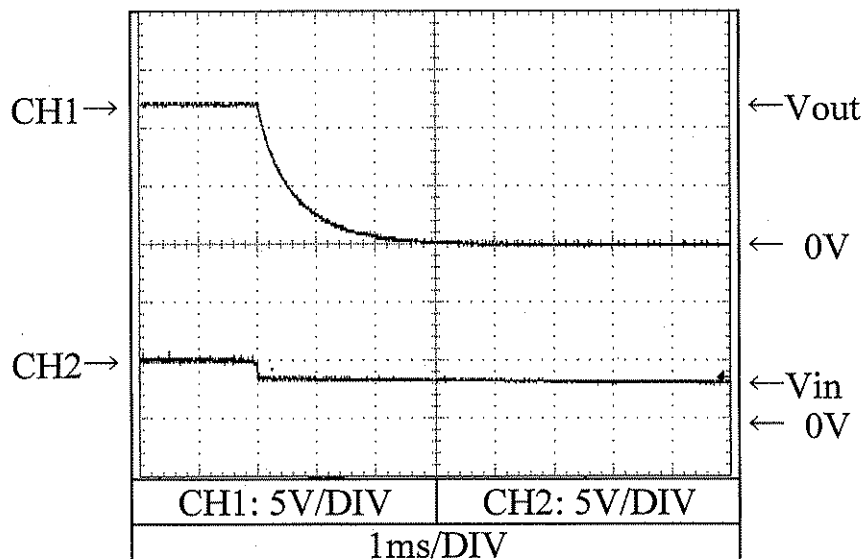
3.3V



5V



12V

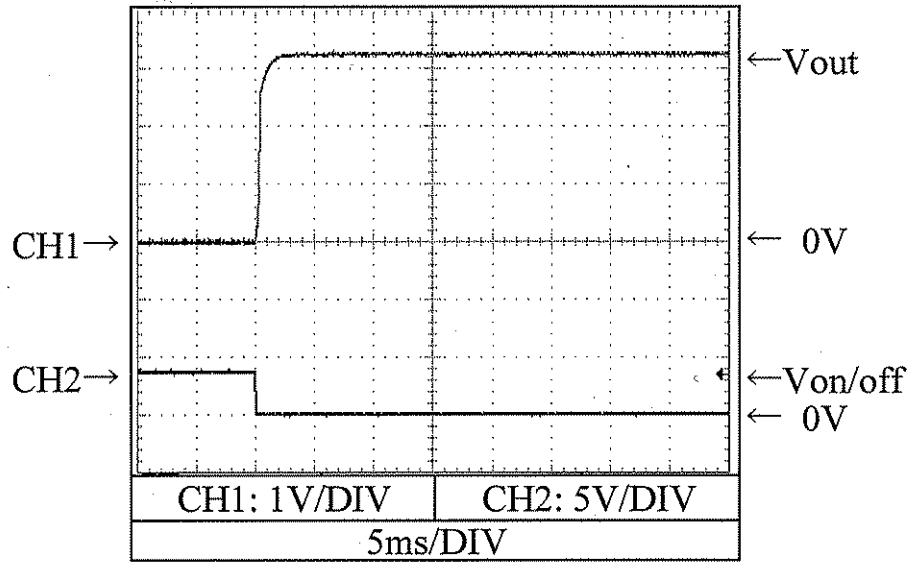


2.6 出力立ち上がり特性 (ON/OFFコントロール時)
Output rise characteristics with ON/OFF CONTROL

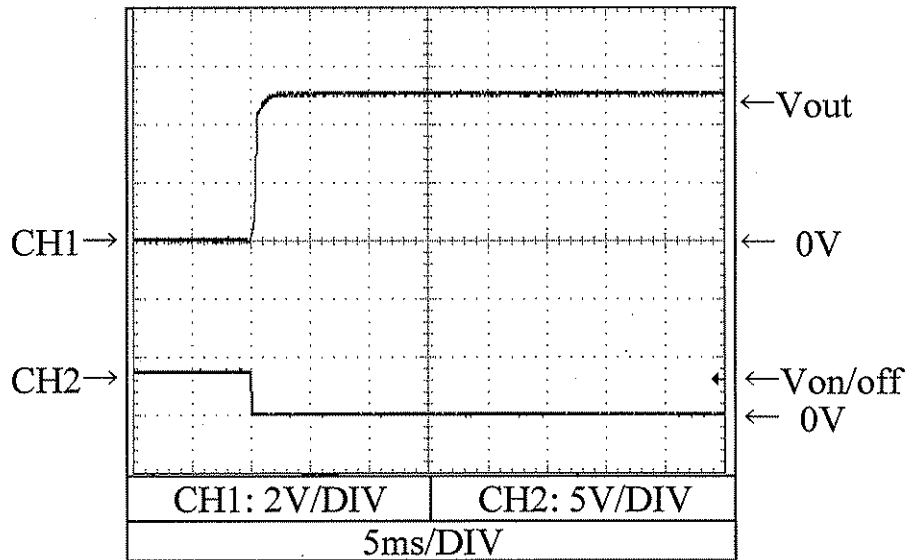
PSS6-5-*

Conditions Vin : 5 VDC
Iout : 0 %
Ta : 25 °C

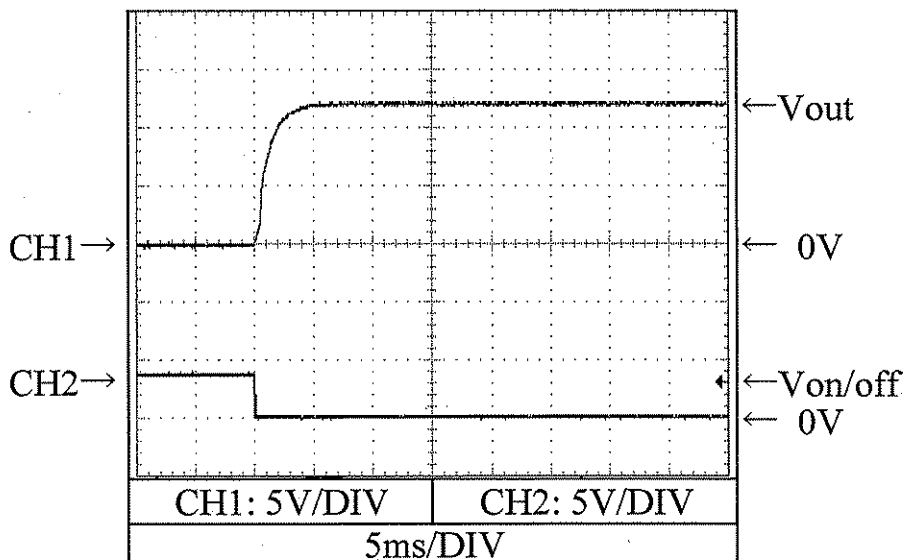
3.3V



5V



12V

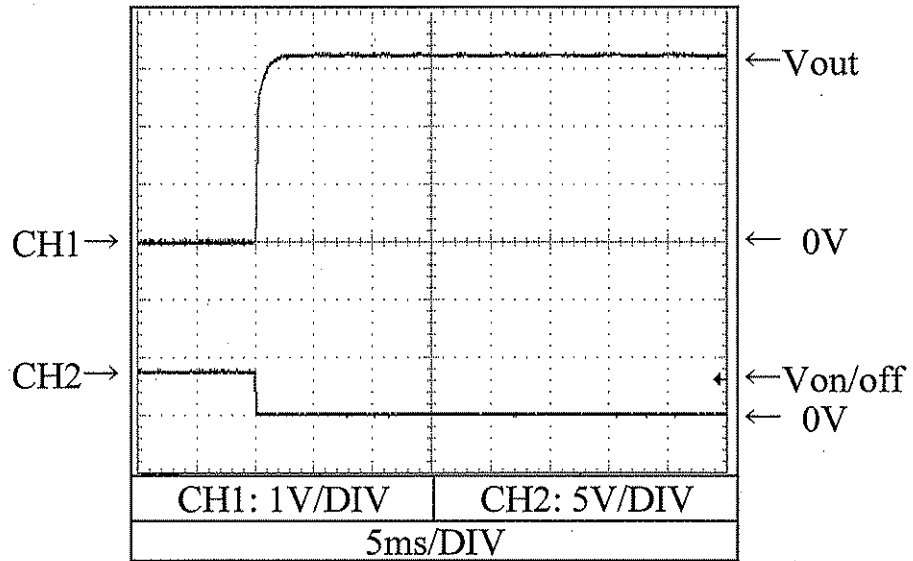


2.6 出力立ち上がり特性 (ON/OFFコントロール時)
Output rise characteristics with ON/OFF CONTROL

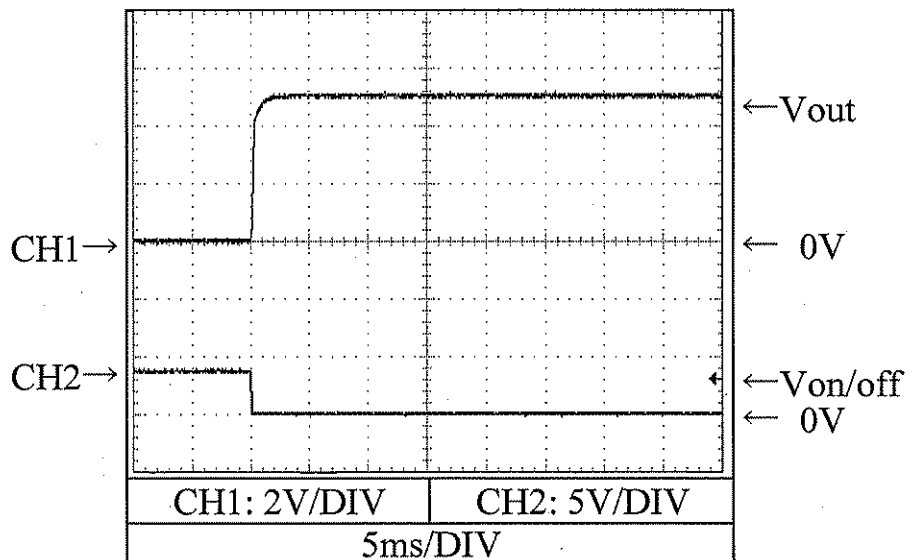
PSS6-5-*

Conditions Vin : 5 VDC
Iout : 100 %
Ta : 25 °C

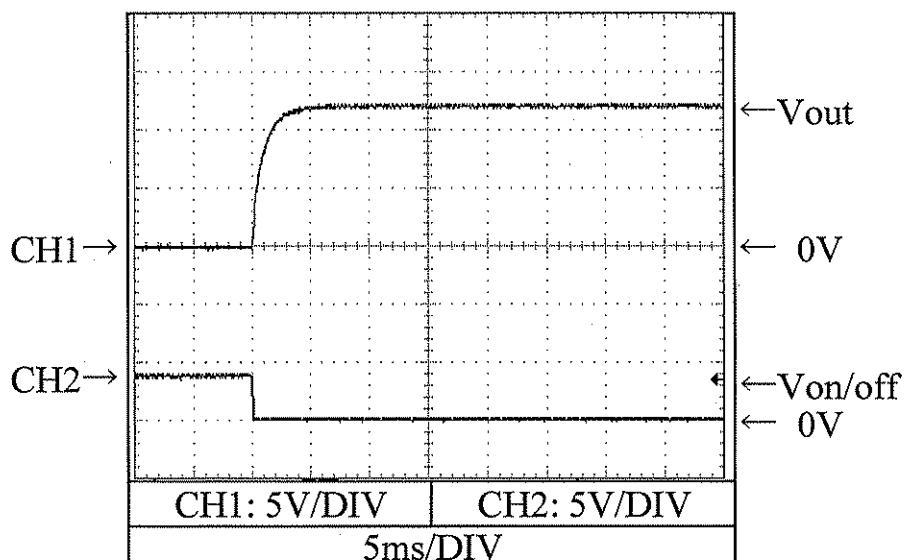
3.3V



5V



12V

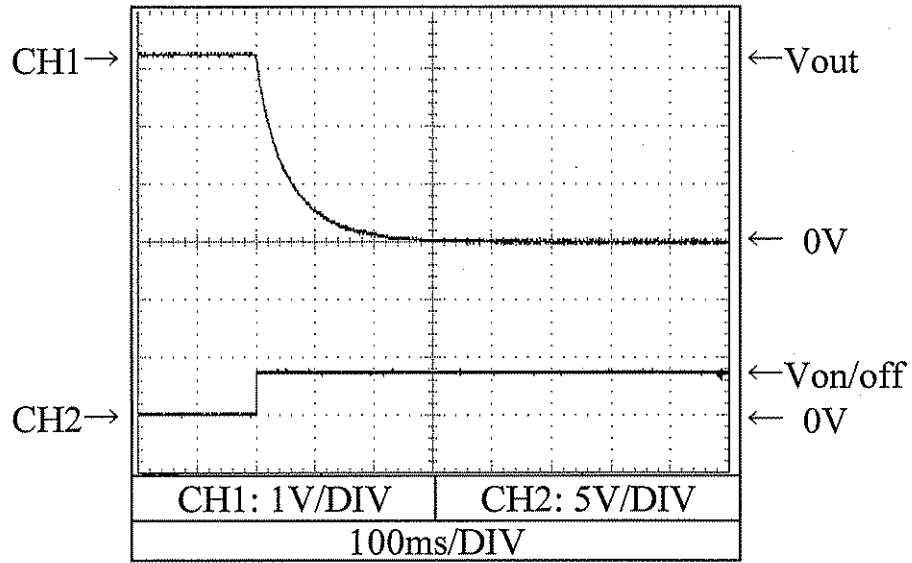


2.7 出力立ち下がり特性 (ON/OFFコントロール時)
 Output fall characteristics with ON/OFF CONTROL

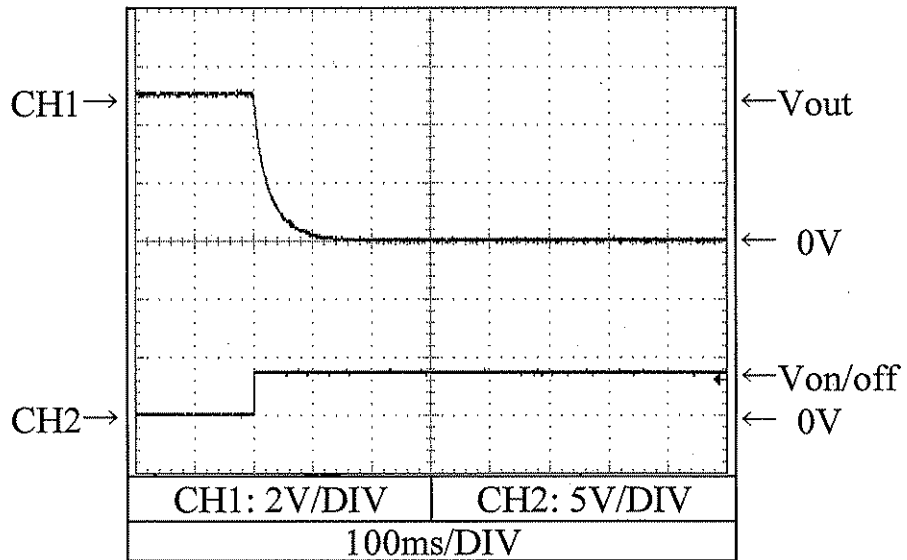
PSS6-5-*

Conditions Vin : 5 VDC
 Iout : 0 %
 Ta : 25 °C

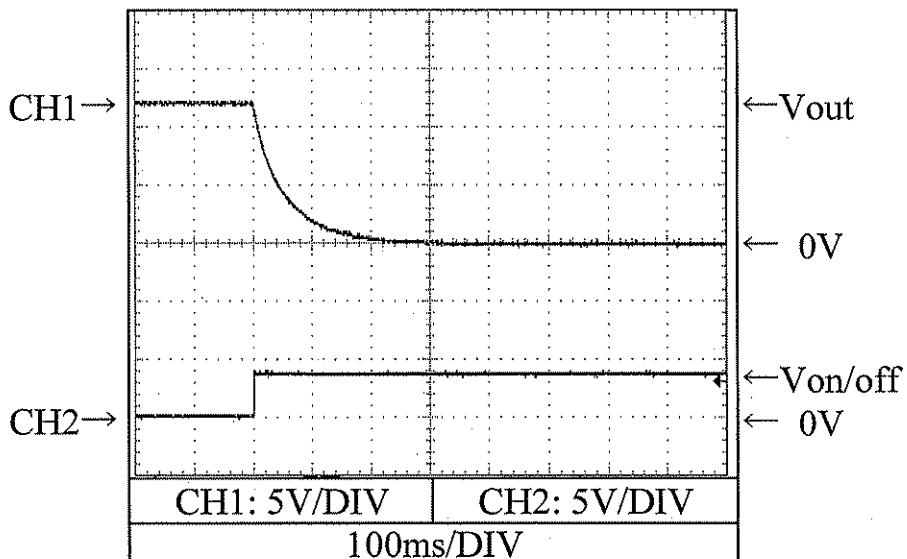
3.3V



5V



12V

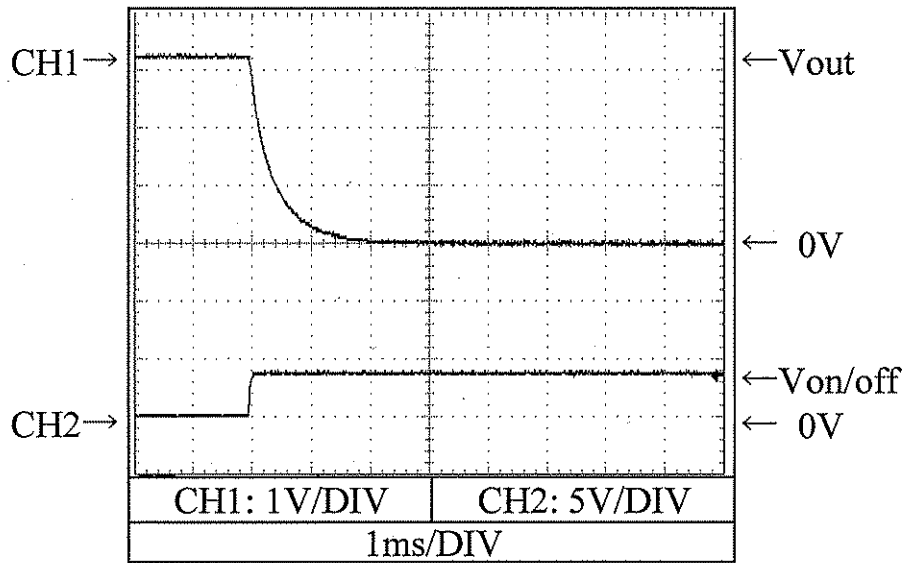


2.7 出力立ち下がり特性 (ON/OFFコントロール時)
Output fall characteristics with ON/OFF CONTROL

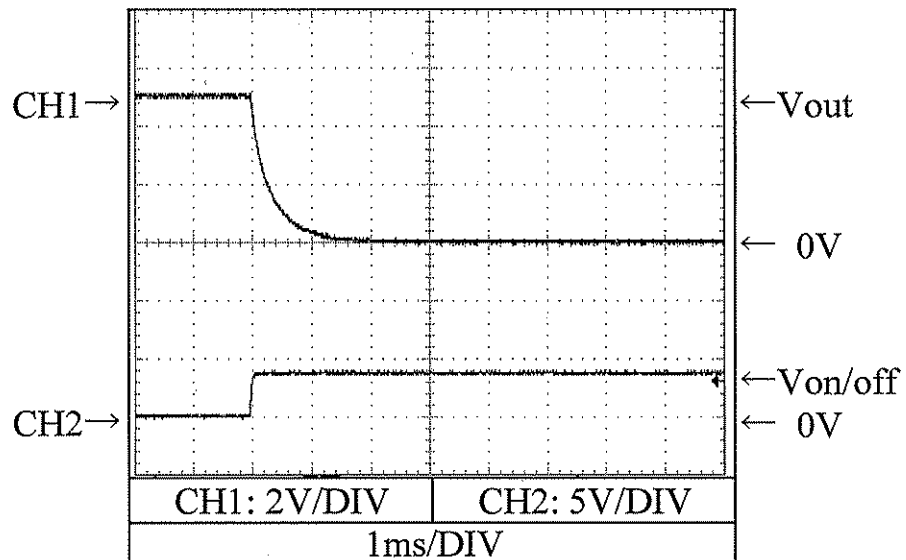
PSS6-5-*

Conditions Vin : 5 VDC
Iout : 100 %
Ta : 25 °C

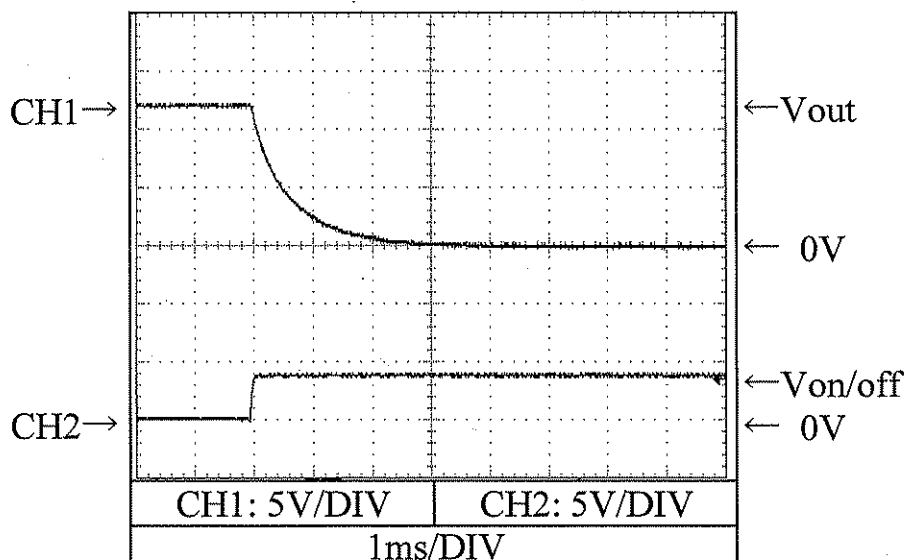
3.3V



5V



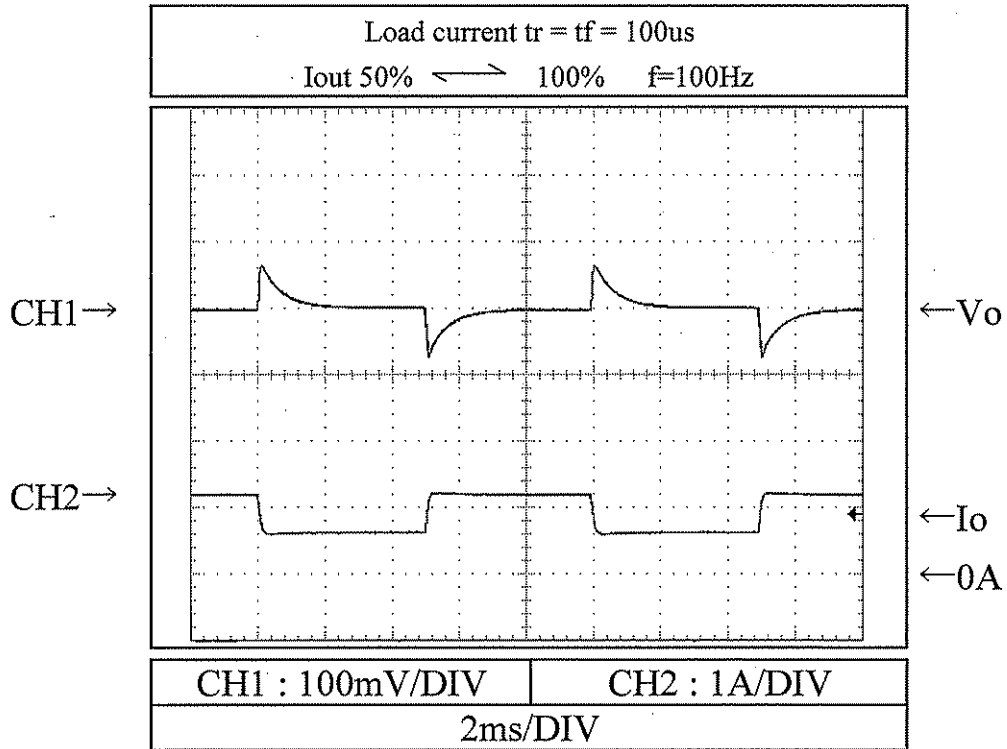
12V



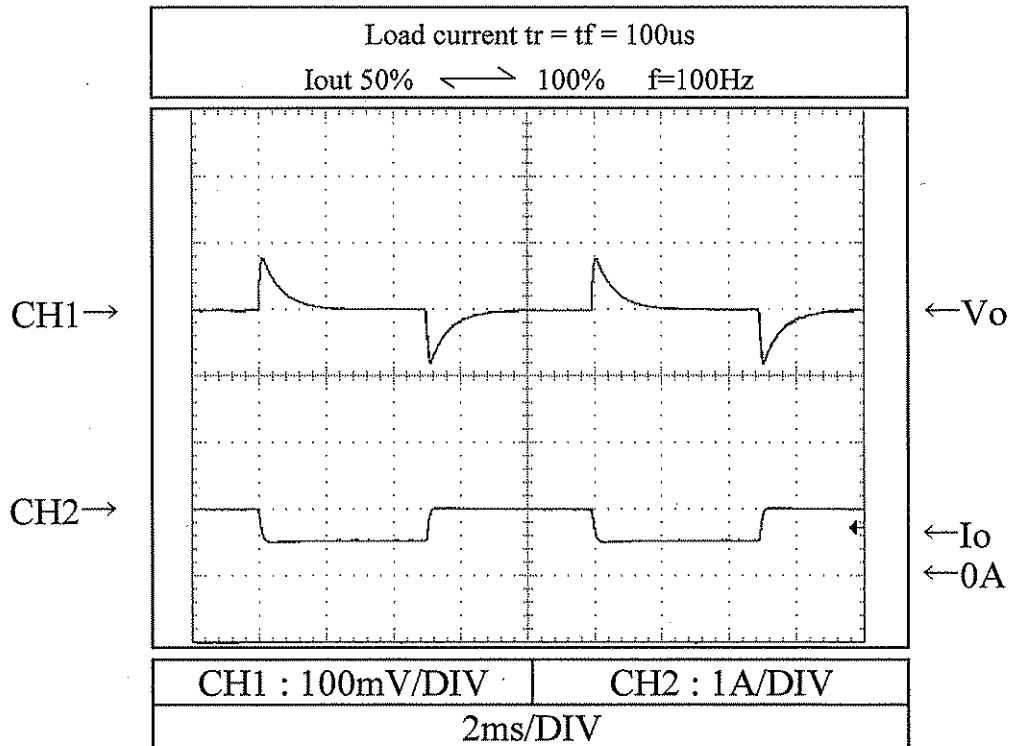
2.8 過渡応答 (負荷急変) 特性
Dynamic load response characteristics

Conditions Vin : 5 VDC
Ta : 25 °C

3.3V



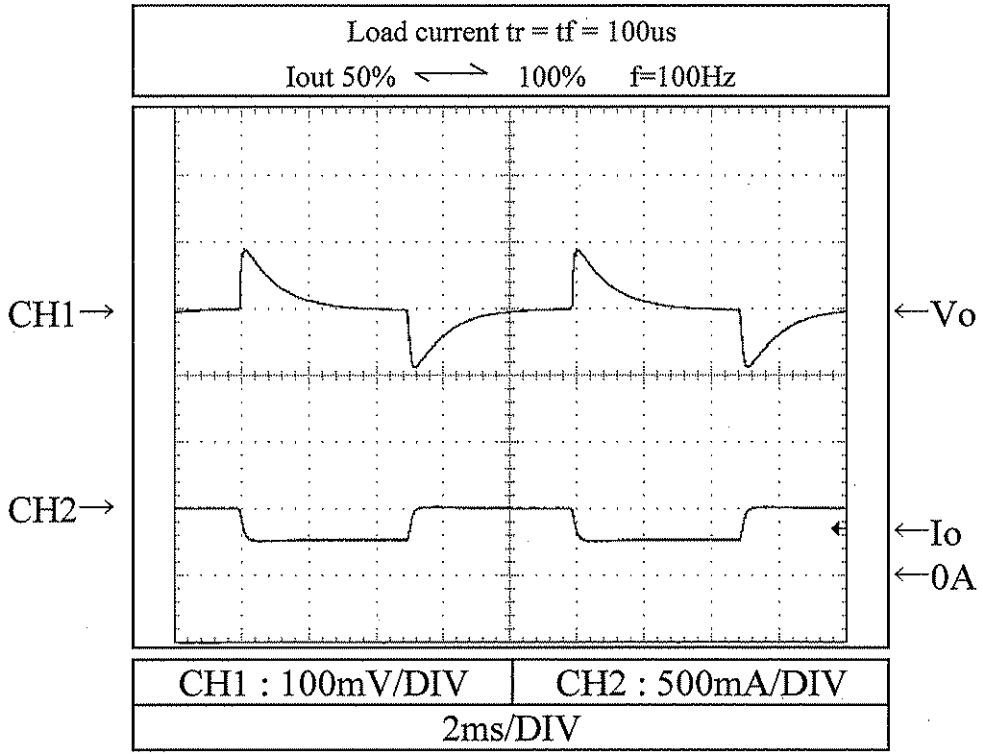
5V



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

Conditions V_{in} : 5 VDC
 T_a : 25 °C

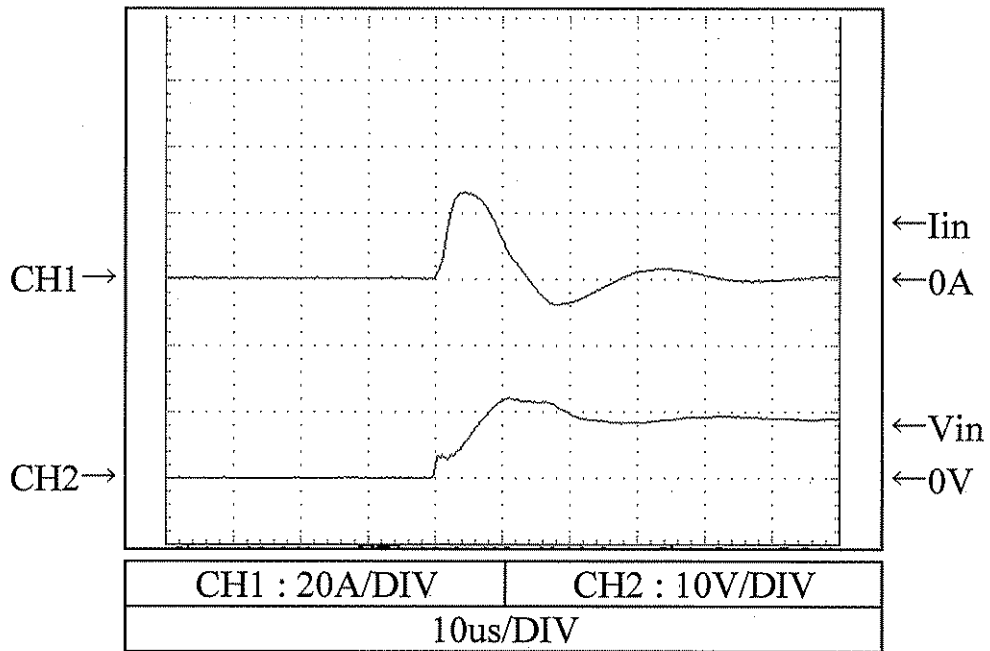
12V



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

Conditions Vin : 9 VDC
Iout : 100 %
Ta : 25 °C

5V



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

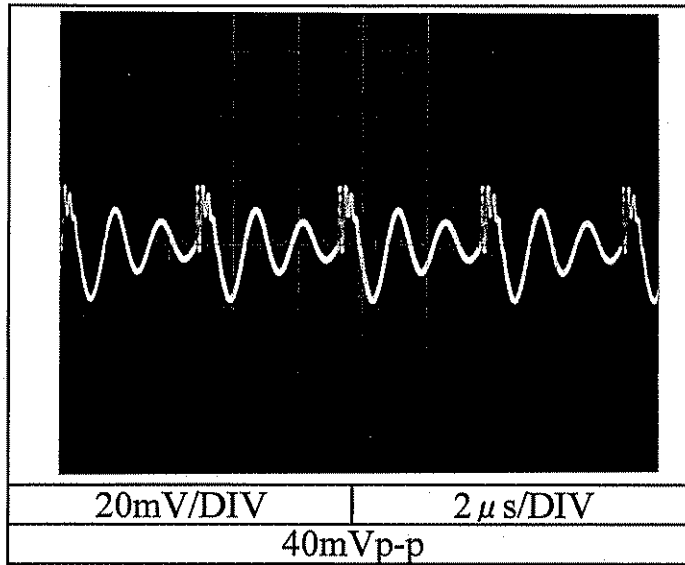
PSS6-5*

Conditions V_{in} : 5 VDC

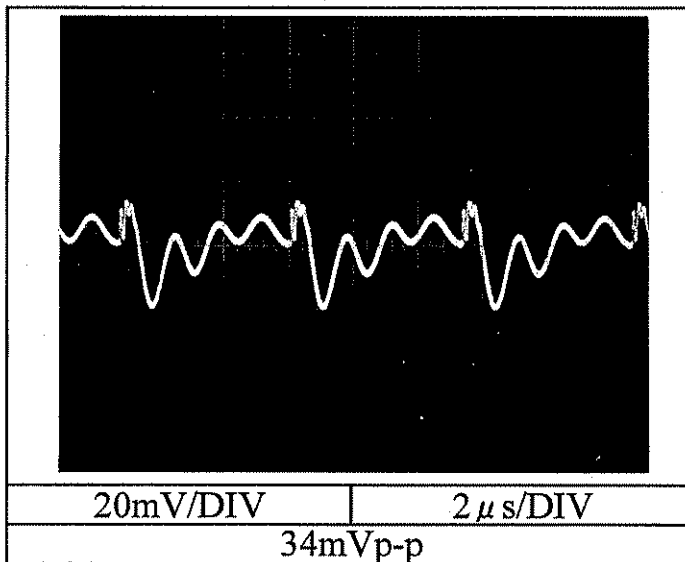
I_{out} : 100 %

T_a : 25 °C

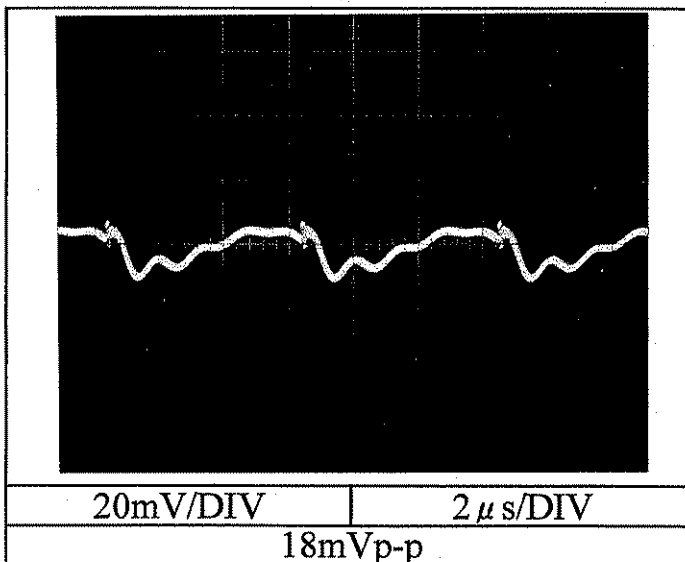
3.3V



5V



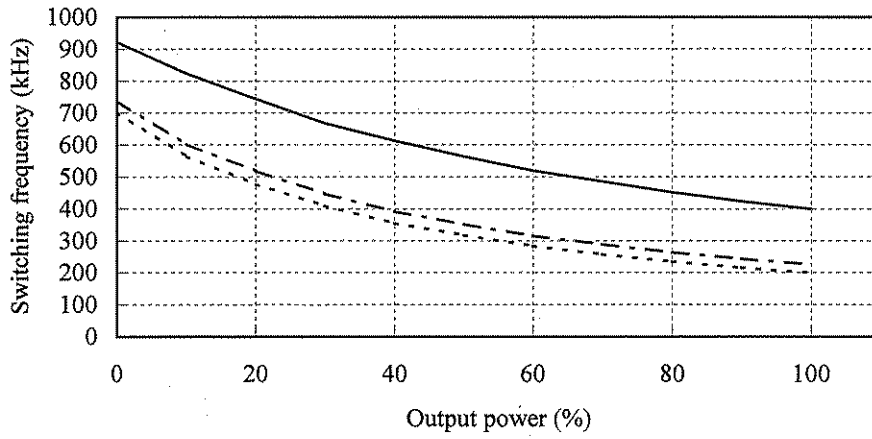
12V



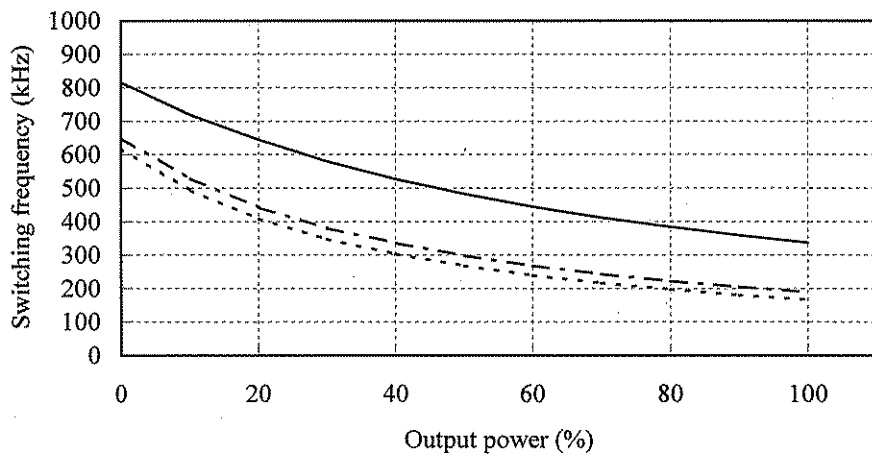
2.11 スイッチング周波数対出力電力
Switching frequency v.s. output power

Conditions Vin : 4.5 VDC -----
5 VDC - - - - -
9 VDC ————
Ta : 25 °C

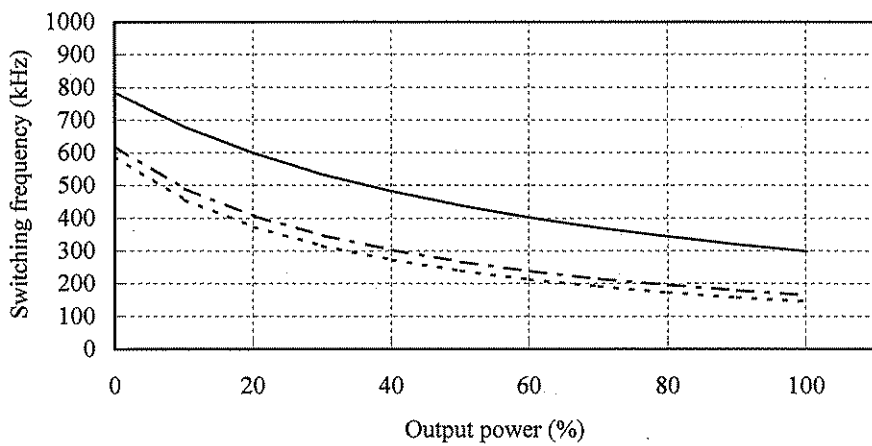
3.3V



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

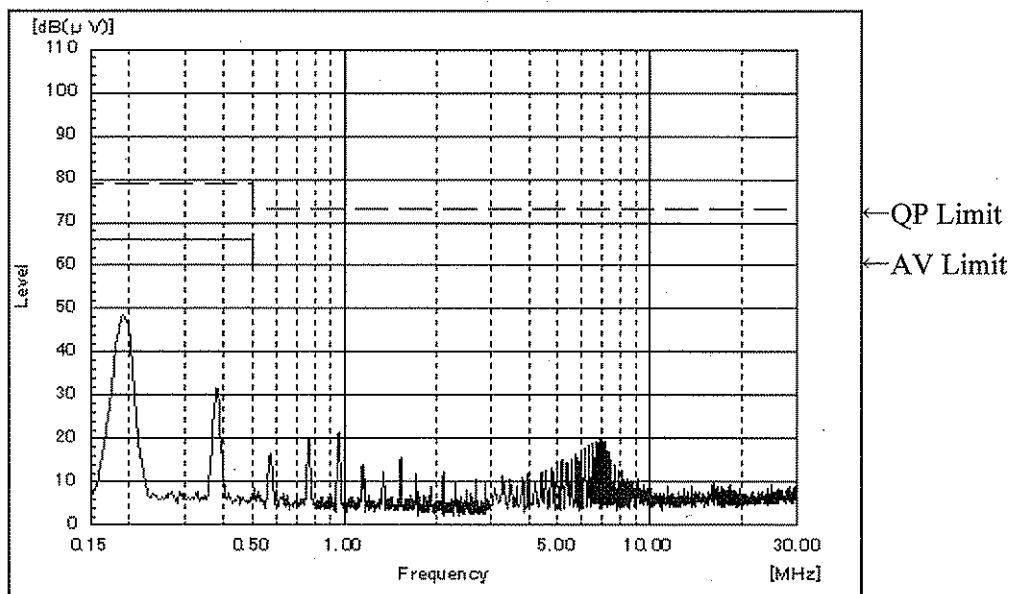
VCCI class A application system

Conditions Vin : 5 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

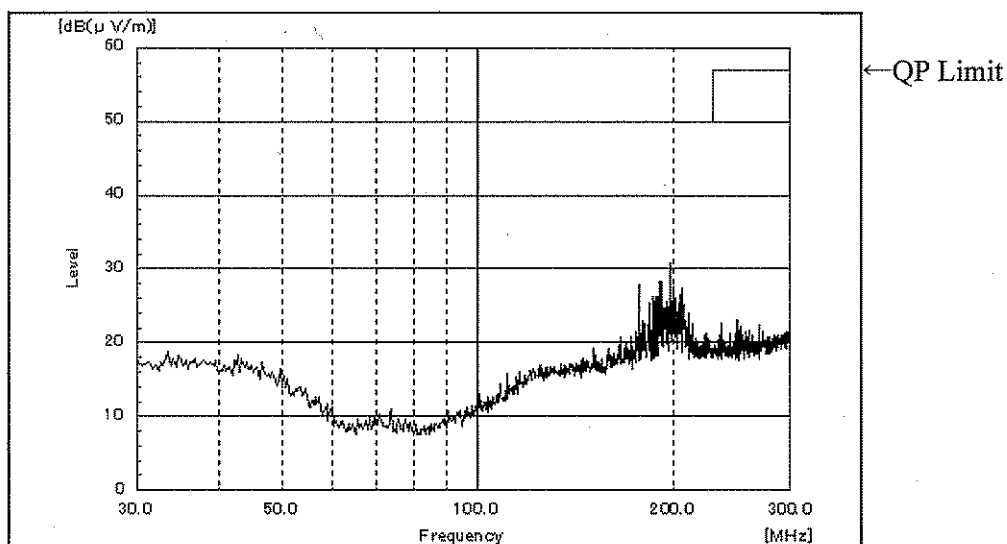
Conditions Vin : 5 VDC

Iout : 100 %

Ta : 25 °C

5V

HORIZONTAL:



VERTICAL:

