# PSS1R5-24-*

# EVALUATION DATA

# 型式データ

| DWG.No. C182-53-01B | | |
|---|---|---|
| 承認 | 査閲 | 担当 |
| N. Uesono | t. Suzuki | M. Hirai |
| 15. Sep. '05 | 1. Sep. '05 | 30. Aug. '05 |

DENSEI-LAMBDA

# INDEX



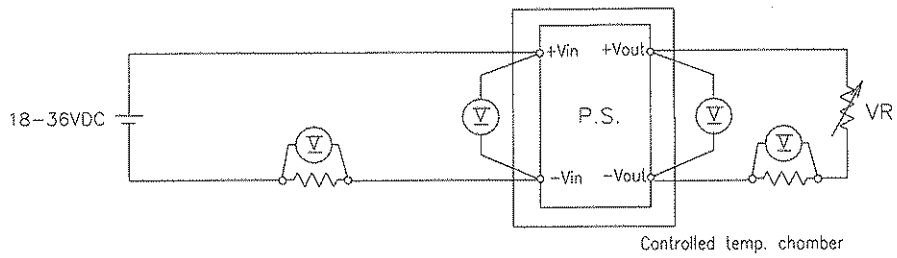
使用記号　Terminology used

| | Definition | | |
|---|---|---|---|
| Vin | ..... | 入力電圧 | Input Voltage |
| Vout | ..... | 出力電圧 | Output Voltage |
| Iin | ..... | 入力電流 | Input Current |
| Iout | ..... | 出力電流 | Output Current |
| Ta | ..... | 周囲温度 | Ambient Temperature |

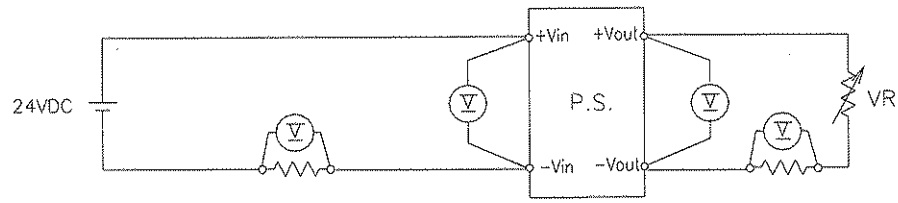
1. 測定方法　　Evaluation Method

1. 1 測定回路　　Circuits used for determination

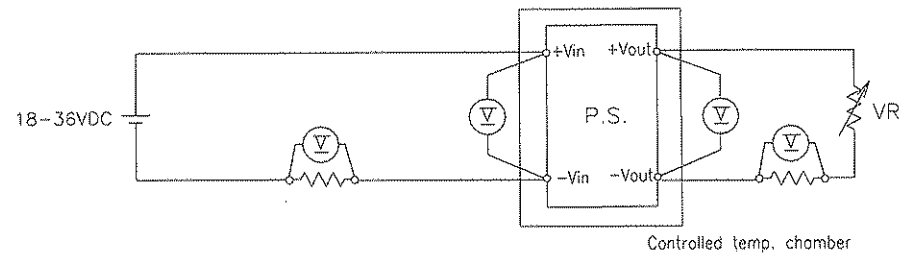
(1) 静特性　Steady state data



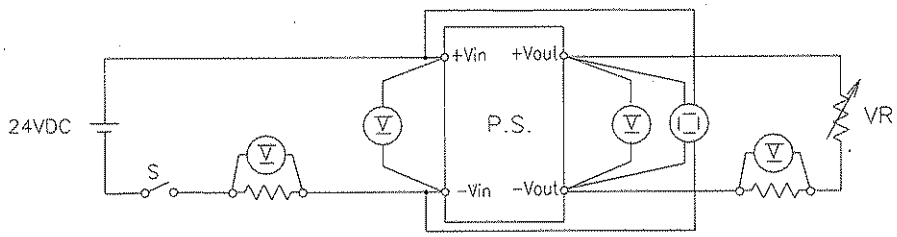

(2) 通電ドリフト特性　Warm up voltage drift characteristics




(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

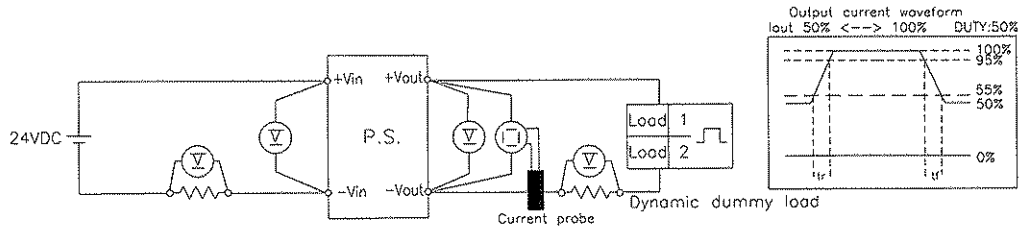



(5) 出力立ち下がり特性 Output fall characteristics

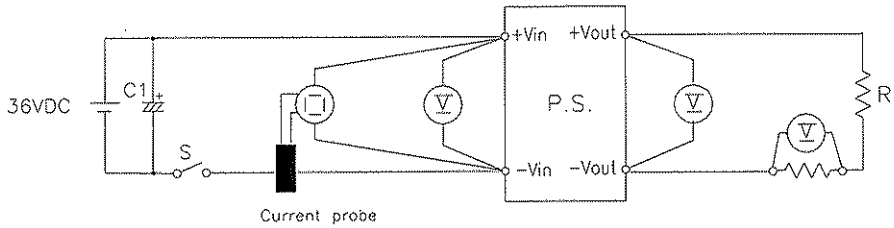
出力立ち上がり特性と同じ

Same as output rise characteristics

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

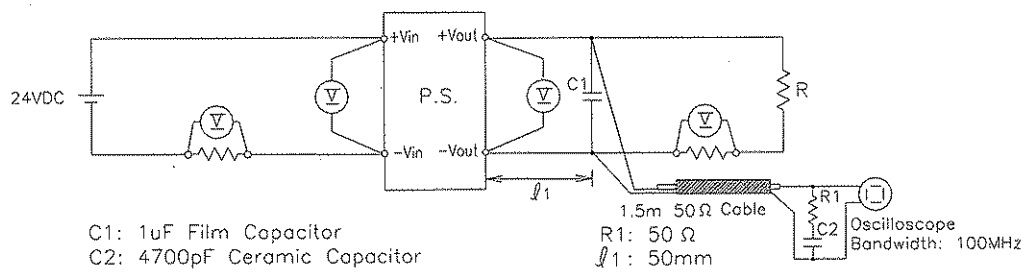


(7) 入力サージ電流（突入電流）特性　Inrush current characteristics



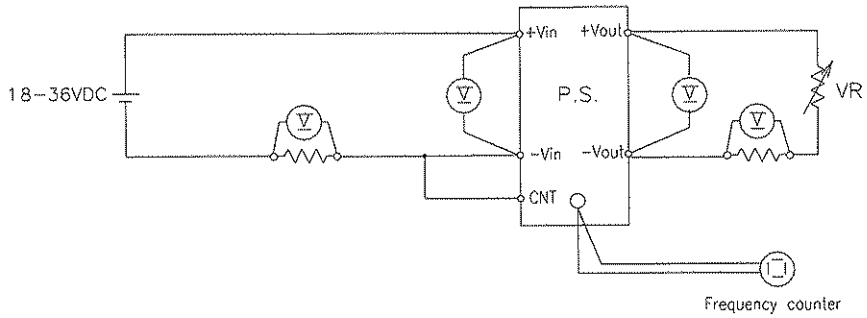

C1: 4000uF Electrolytic Capacitor

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



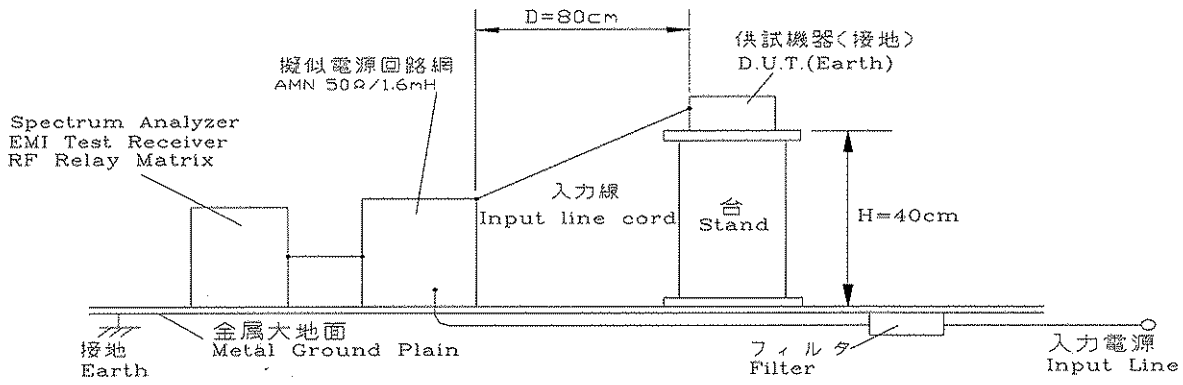

C1: 1uF Film Capacitor
C2: 4700pF Ceramic Capacitor
R1: 50 Ω
ℓ1: 50mm

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

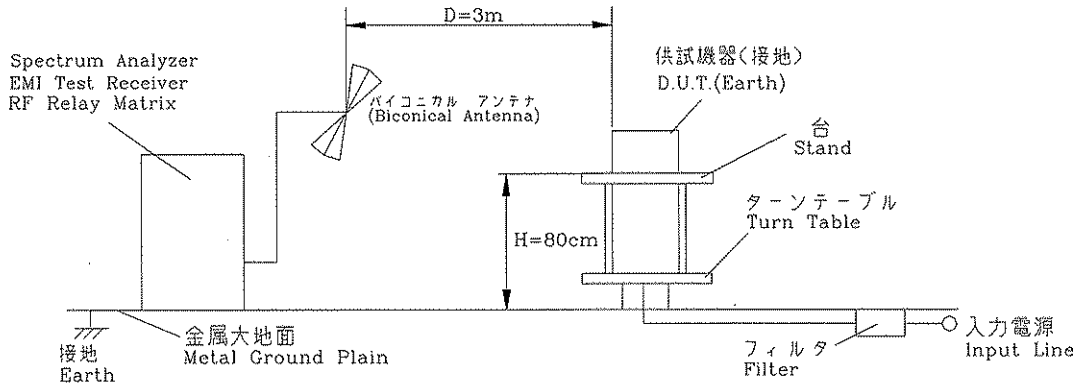


(10) ＥＭＩ特性　Electro-Magnetic Interference characteristics

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

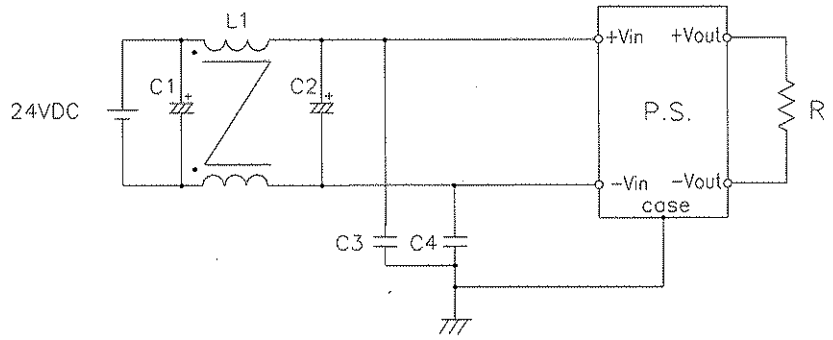



(b)　雑音電界強度（輻射ノイズ）　Radiated Emission Noise




(1) VCCI class A 対応アプリケーションシステム

VCCI class A application system




L1: 2mH　　C2: 100uF Electrolytic Capacitor
C1: 10uF 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-1100A |
| 2 | DIGITAL STORAGE OSCILLOSCOPE | YOKOGAWA ELECT. | DL1740 |
| 3 | DIGITAL MULTIMETER | AGILENT | 34970A |
| 4 | CURRENT PROBE/AMPLIFIER | TEKTRONIX | A6303/TM503B |
| 5 | SHUNT RESISTER | YOKOGAWA ELECT. | 2215 |
| 6 | DYNAMIC DUMMY LOAD | TAKASAGO | FK-200L |
| 7 | INPUT POWER SUPPLY | TAKASAGO | AA2000XG |
| 8 | CONTROLLED TEMP. CHAMBER | TABAI ESPEC | SU-261 |
| 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℃

| Iout \ Vin | 18VDC | 24VDC | 36VDC | line regulation | |
|---|---|---|---|---|---|
| 0% | 3.252V | 3.252V | 3.252V | 0mV | 0.000% |
| 50% | 3.251V | 3.251V | 3.251V | 0mV | 0.000% |
| 100% | 3.251V | 3.251V | 3.251V | 0mV | 0.000% |
| load | 1mV | 0mV | 1mV | | |
| regulation | 0.03% | 0.00% | 0.03% | | |

2. Temperature drift　　Conditions Vin : 24VDC
Iout : 100%

| Ta | -40℃ | 25℃ | 85℃ | temperature stability | |
|---|---|---|---|---|---|
| Vout | 3.248V | 3.251V | 3.243V | 8mV | 0.25% |

## 5V

1. Regulation - line and load　　Condition Ta : 25℃

| Iout \ Vin | 18VDC | 24VDC | 36VDC | line regulation | |
|---|---|---|---|---|---|
| 0% | 5.033V | 5.033V | 5.033V | 0mV | 0.000% |
| 50% | 5.032V | 5.032V | 5.033V | 0mV | 0.000% |
| 100% | 5.032V | 5.032V | 5.032V | 0mV | 0.000% |
| load | 0mV | 0mV | 1mV | | |
| regulation | 0.00% | 0.00% | 0.02% | | |

2. Temperature drift　　Conditions Vin : 24VDC
Iout : 100%

| Ta | -40℃ | 25℃ | 85℃ | temperature stability | |
|---|---|---|---|---|---|
| Vout | 5.003V | 5.032V | 5.038V | 35mV | 0.70% |

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℃

| Iout \ Vin | 18VDC | 24VDC | 36VDC | line regulation | |
|---|---|---|---|---|---|
| 0% | 12.158V | 12.158V | 12.158V | 0mV | 0.000% |
| 50% | 12.157V | 12.157V | 12.158V | 0mV | 0.000% |
| 100% | 12.157V | 12.157V | 12.157V | 0mV | 0.000% |
| load | 0mV | 0mV | 0mV | | |
| regulation | 0.00% | 0.00% | 0.00% | | |

2. Temperature drift　Conditions Vin : 24VDC
Iout : 100%

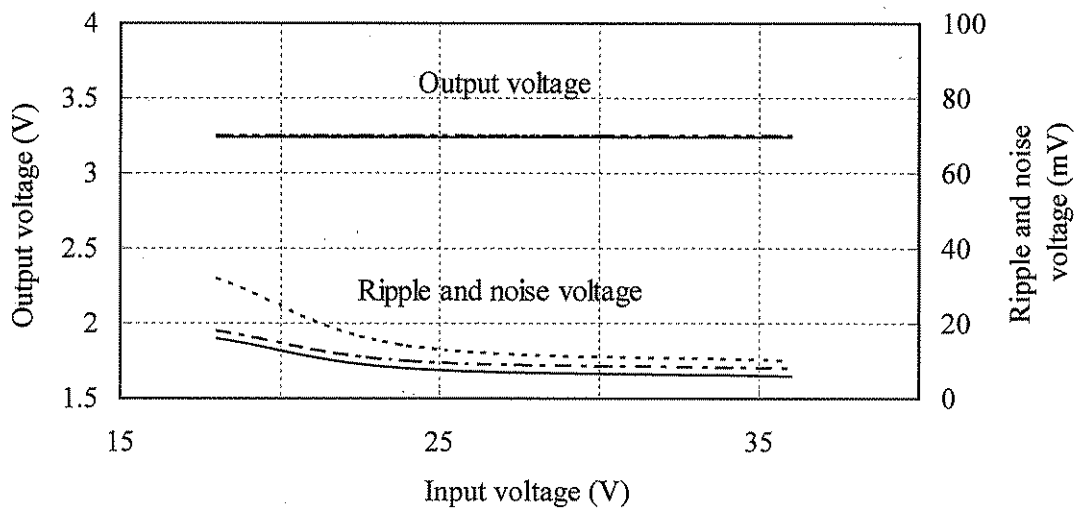
| Ta | -40℃ | 25℃ | 85℃ | temperature stability | |
|---|---|---|---|---|---|
| Vout | 12.109V | 12.157V | 12.159V | 50mV | 0.41% |

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

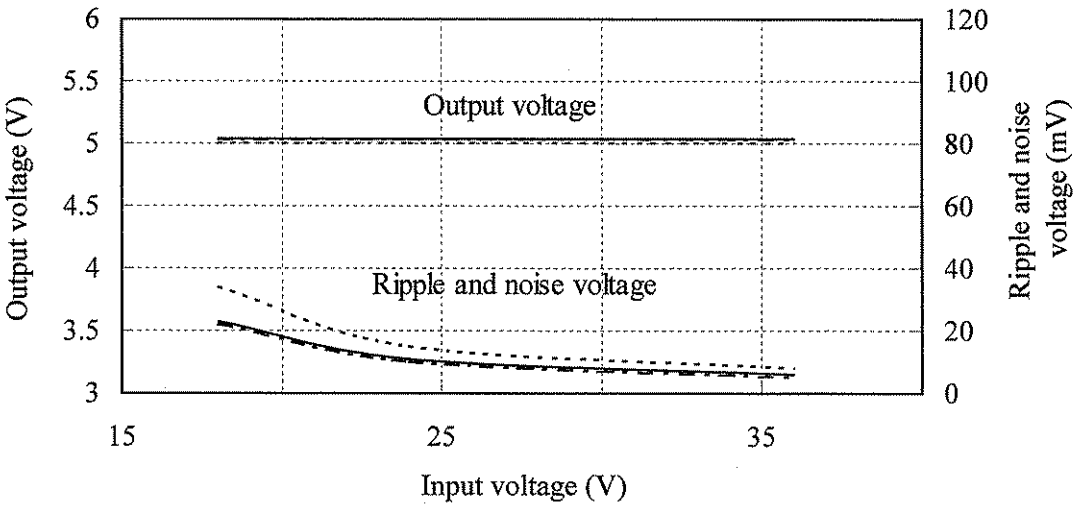
Conditions Iout : 100 %
Ta : -40 ℃
25 ℃
85 ℃

3.3V




Ta : -40 ℃
25 ℃
85 ℃

5V

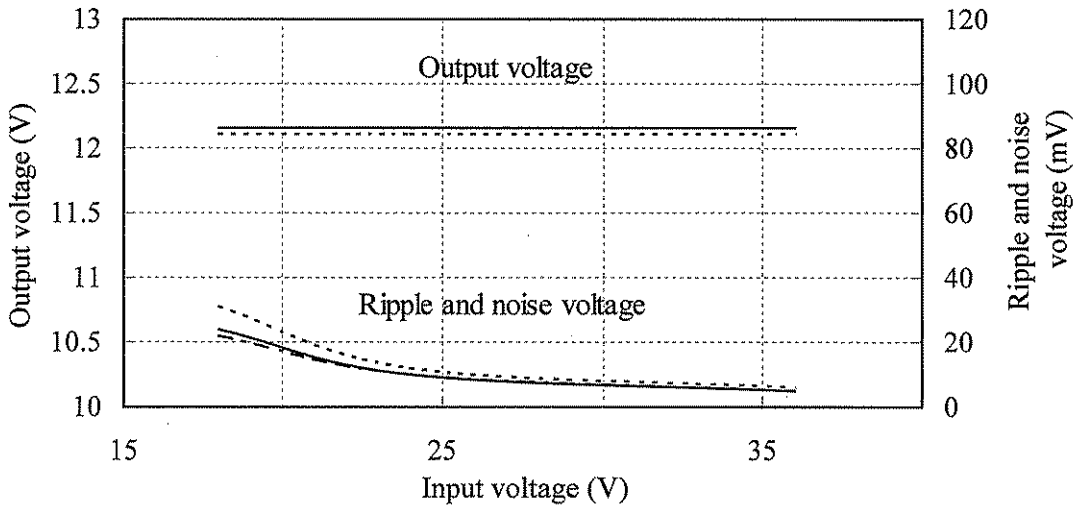


2.1 (2) 出力電圧・リップル電圧対入力電圧

Output voltage and ripple voltage v.s. input voltage

Conditions Iout : 100 %
Ta : -40 ℃
25 ℃
85 ℃

12V

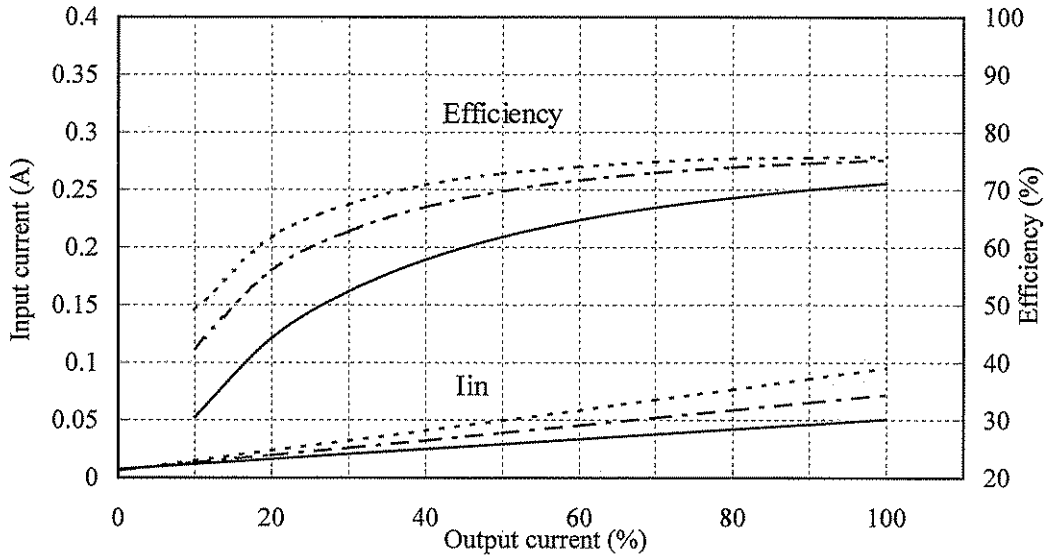


2.1 (3) 効率・入力電流対出力電流

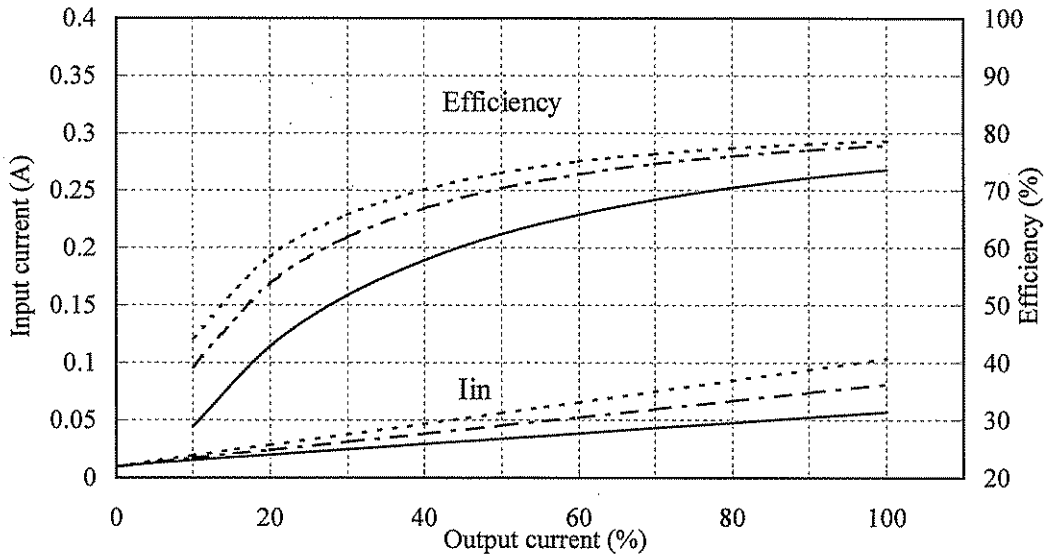
Efficiency and input current v.s. output current

Conditions Vin : 18 VDC -------
: 24 VDC -·-·-·-
: 36 VDC ———
Ta : 25 ℃

3.3V




5V

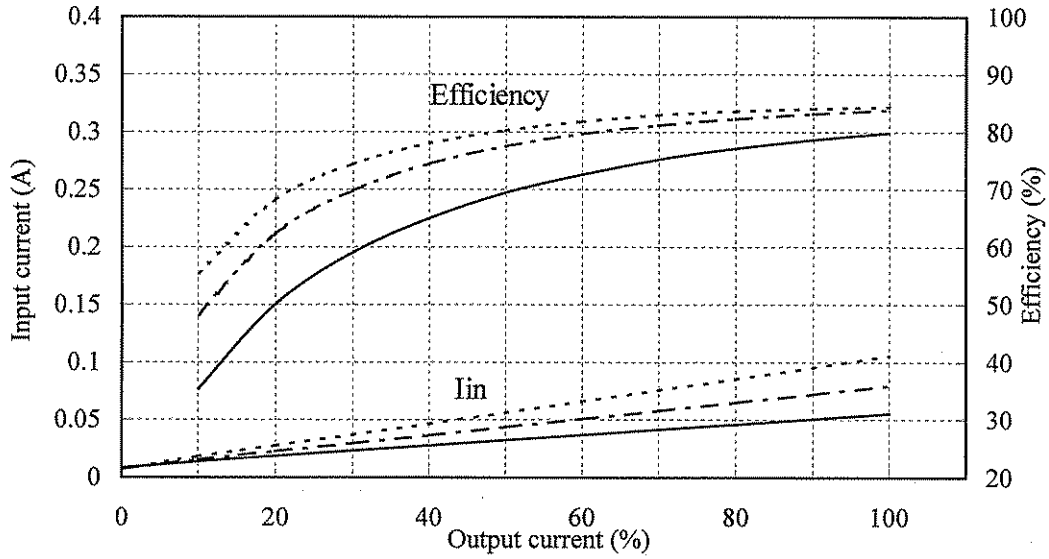


2.1 (3) 効率・入力電流対出力電流

Efficiency and input current v.s. output current

Conditions Vin : 18 VDC ---
: 24 VDC -·-·-
: 36 VDC ———
Ta : 25 ℃

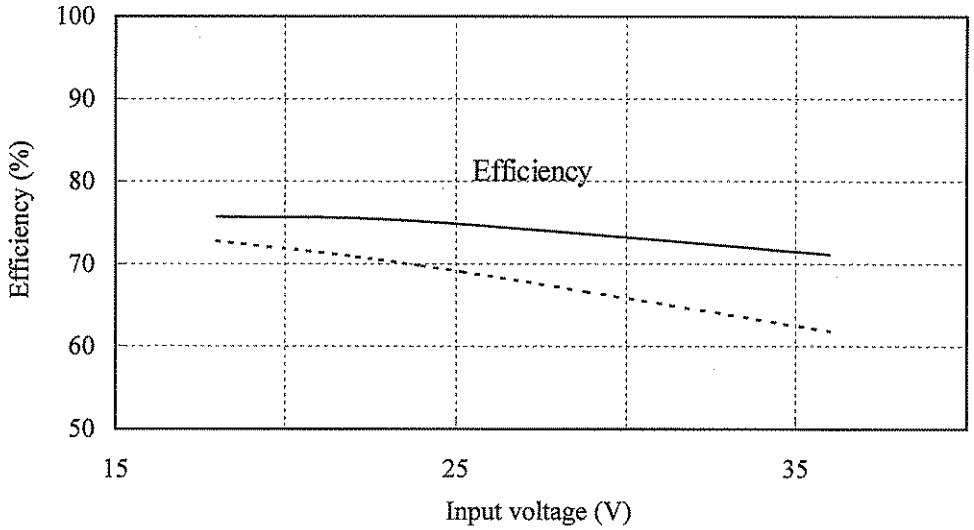
12V



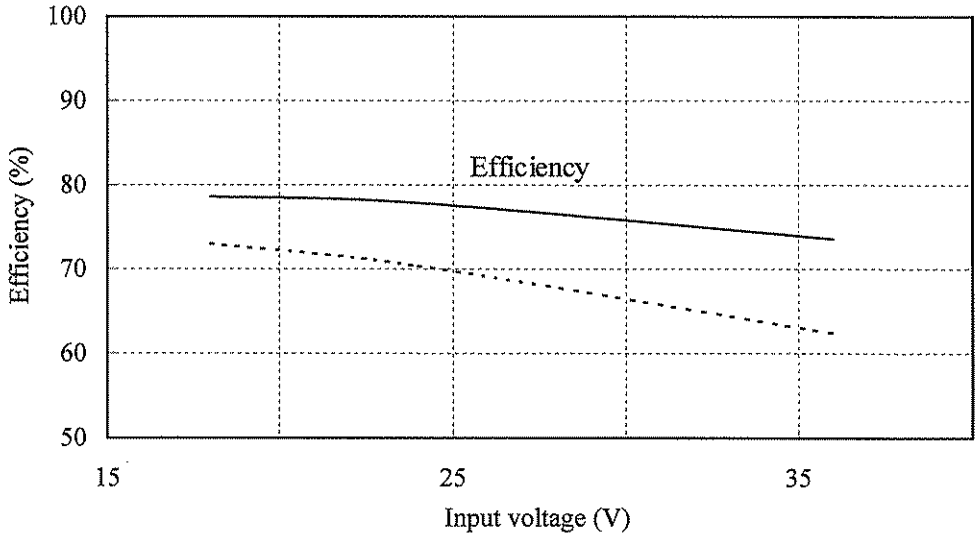
2.1 (4) 効率対入力電圧
Efficiency v.s. Input voltage

Conditions Ta : 25 ℃
Iout : 50 % - - - - - - -
100 % ————

3.3V




5V

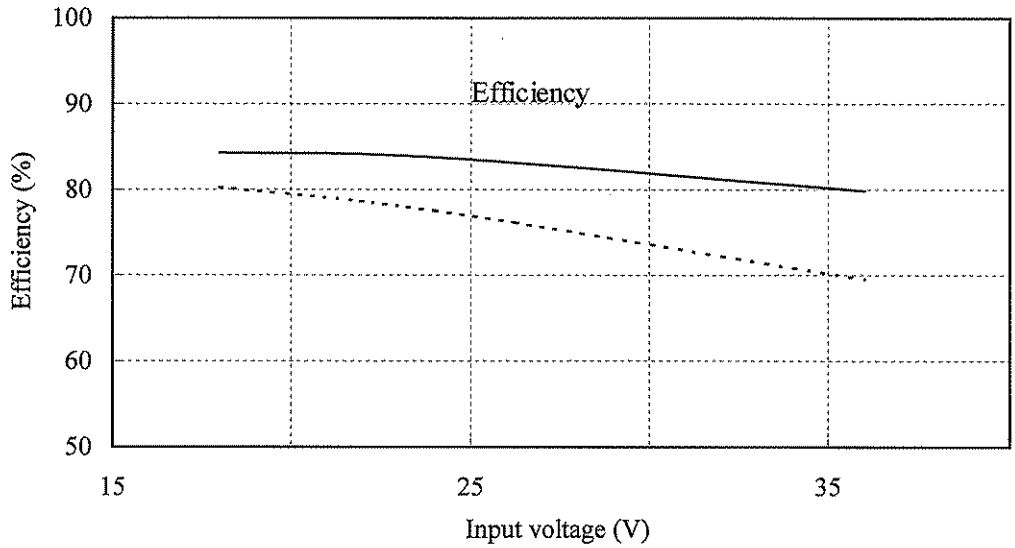


2.1 (4) 効率対入力電圧

Efficiency v.s. Input voltage

Conditions Ta : 25 ℃
Iout : 50 % -------
100 % ———

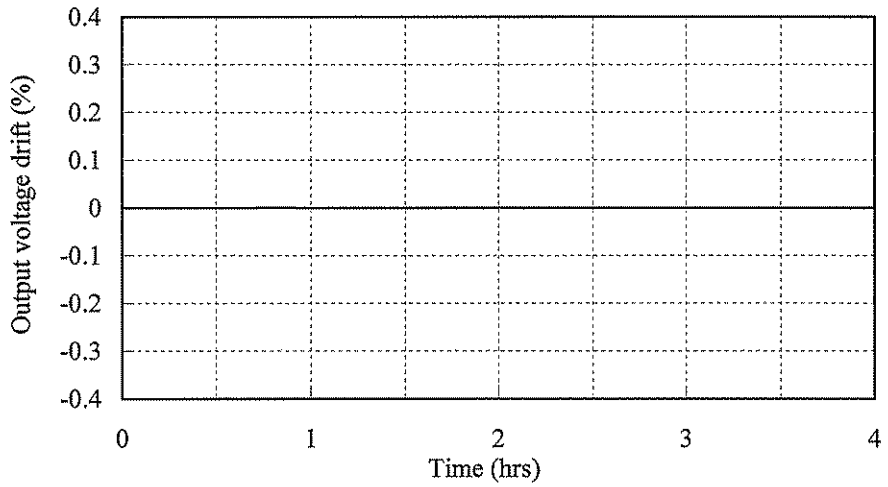
12V



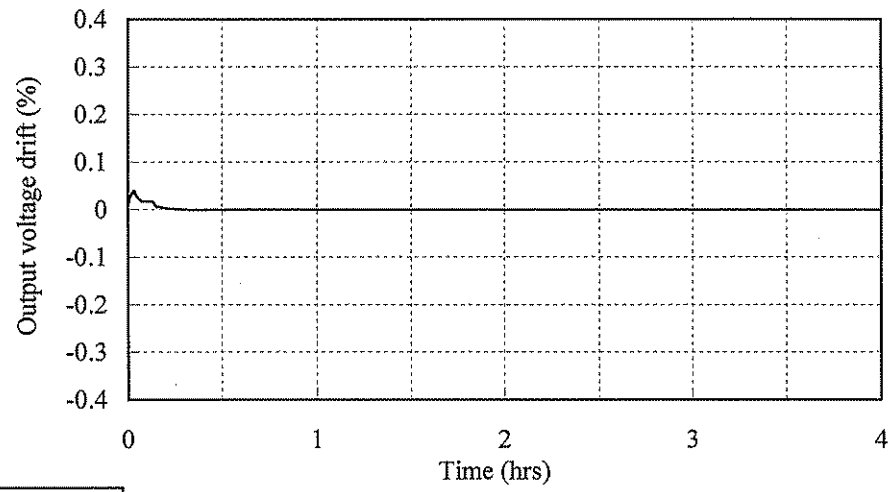
2. 2 通電ドリフト特性
Warm up voltage drift characteristics

Conditions Vin : 24 VDC
Iout : 100 %
Ta : 25 ℃

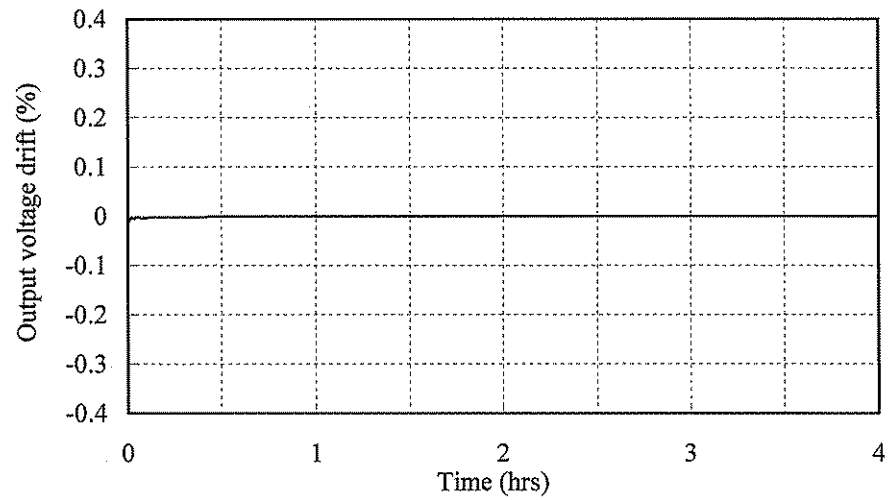
3.3V




5V




12V

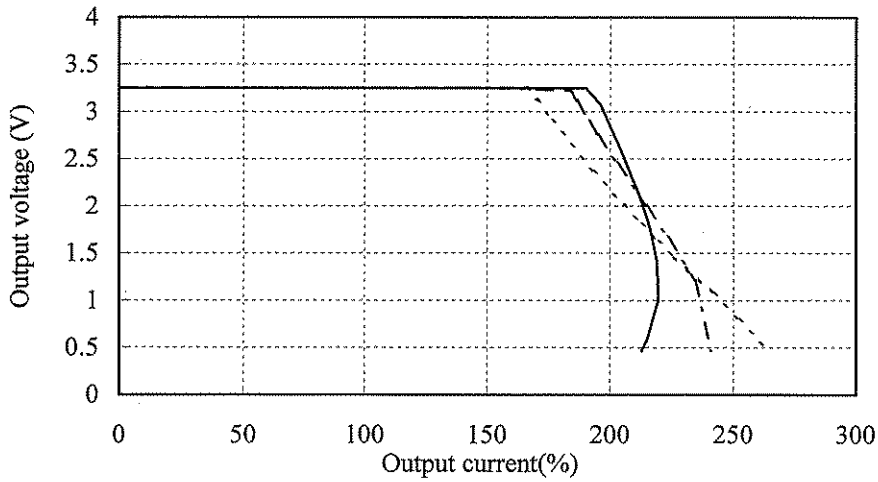


2.3 過電流保護特性
Over current protection (OCP) characteristics

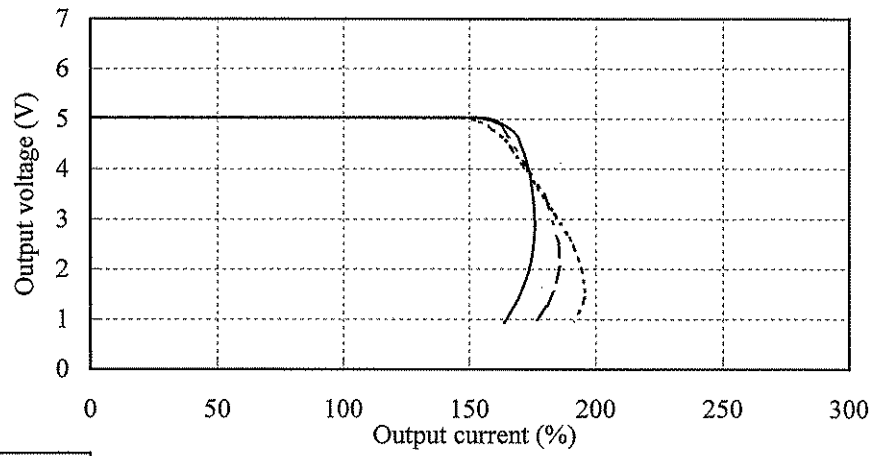
Conditions Vin : 18 VDC -------
24 VDC -·-·-·-
36 VDC ————

Ta : 25 ℃

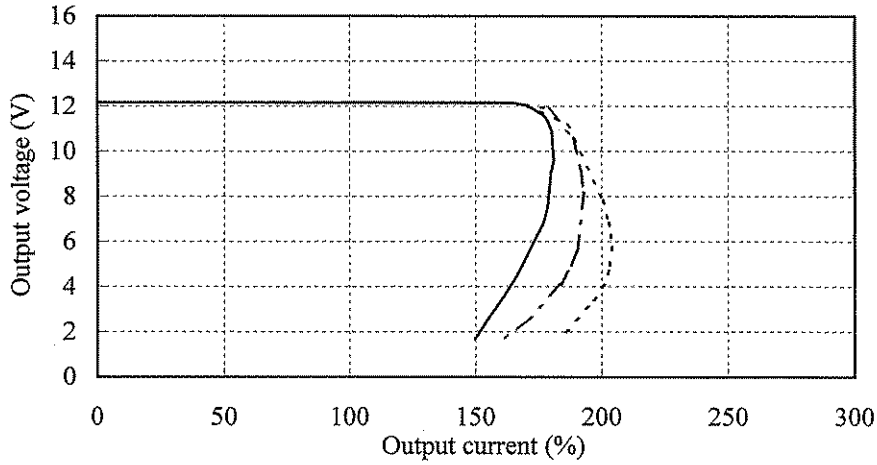
**3.3V**




**5V**



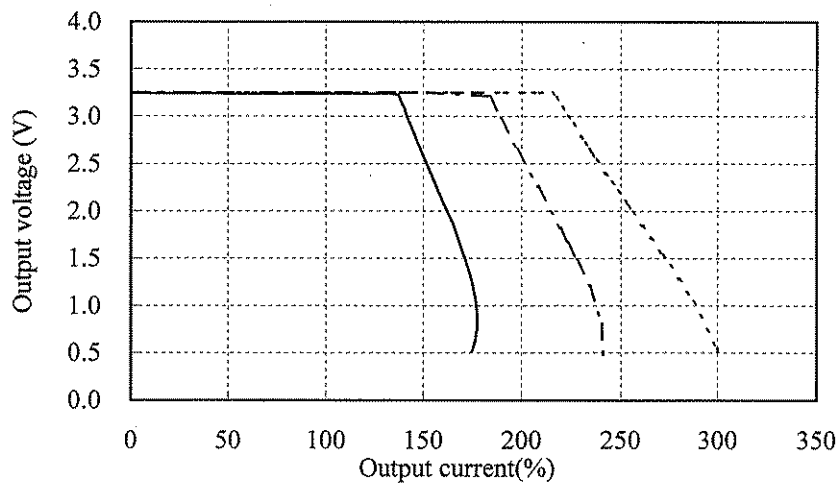

**12V**



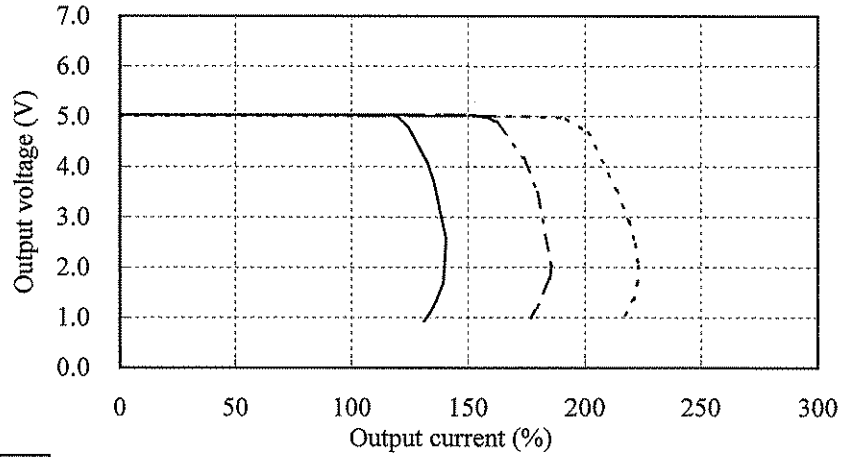
2.3 過電流保護特性
Over current protection (OCP) characteristics

Conditions Vin : 24 VDC
Ta : -40 ℃ -------
25 ℃ - - - - - -
85 ℃ ———

**3.3V**




**5V**

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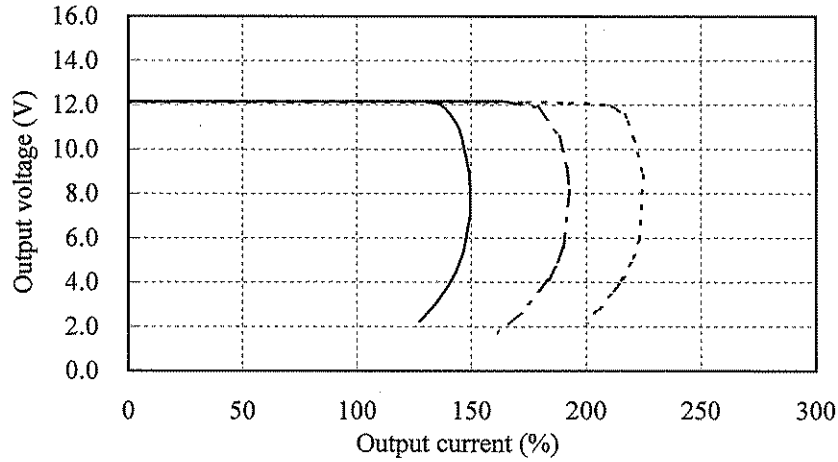
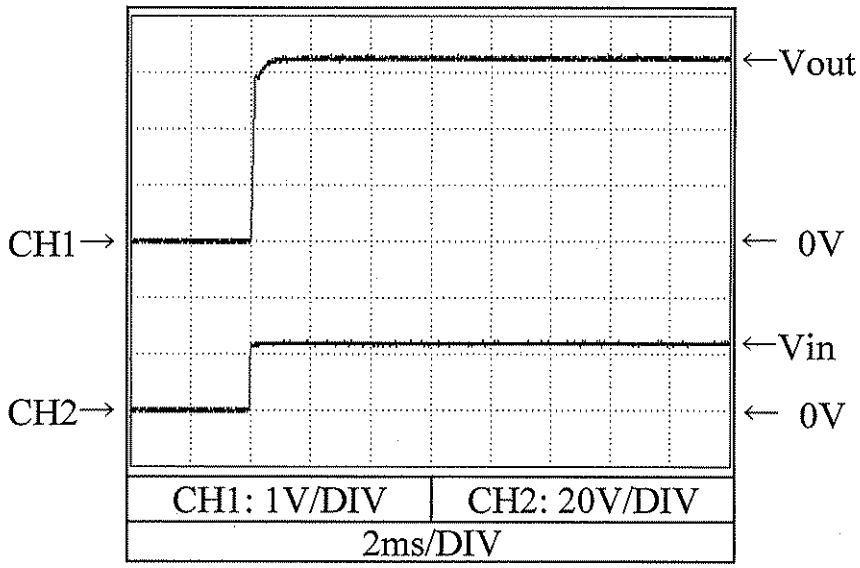
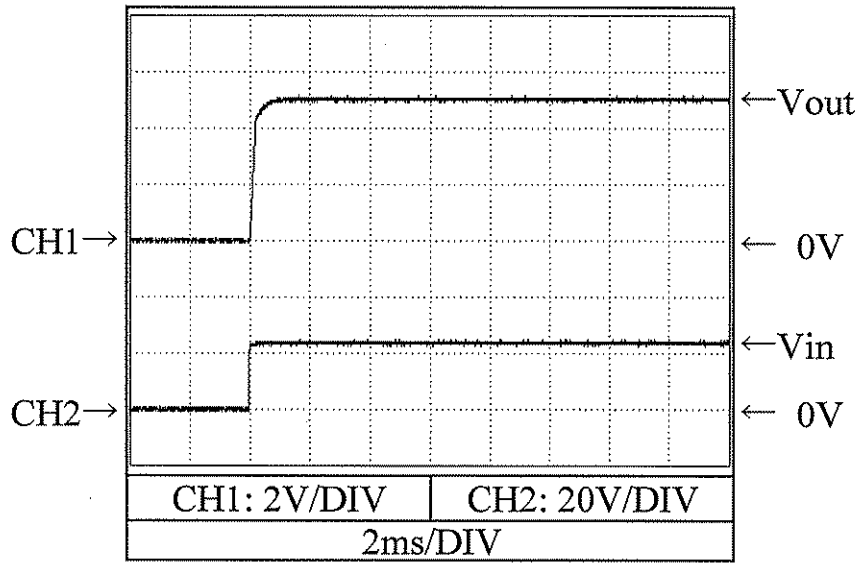


Conditions Vin : 24 VDC
Iout : 0 %
Ta : 25 ℃

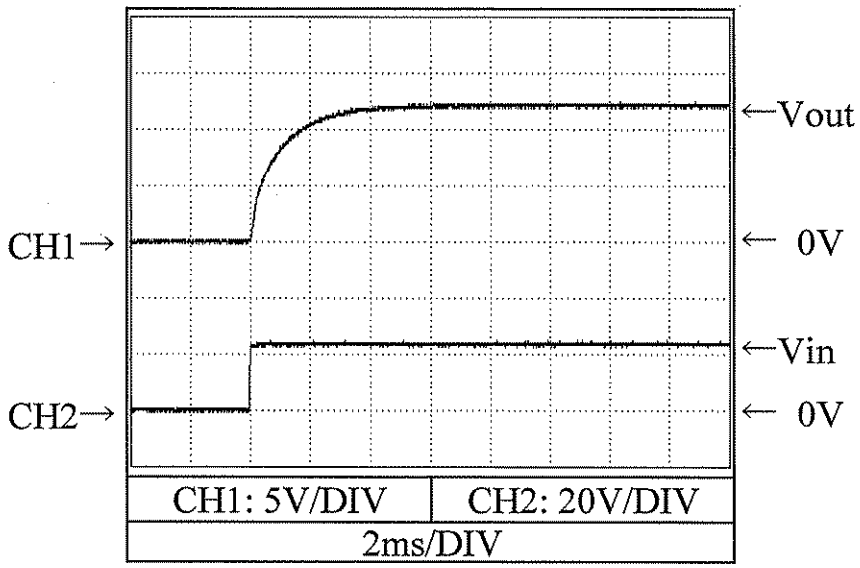
3.3V




5V

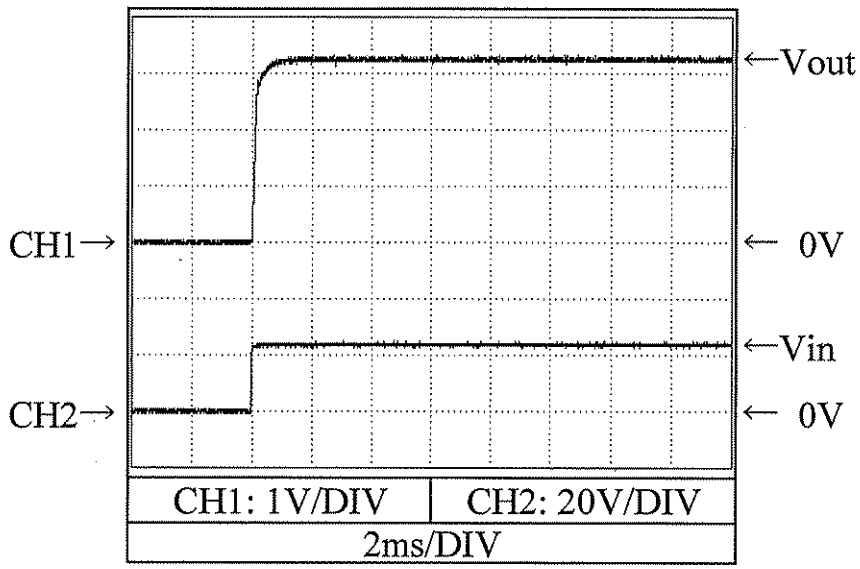



12V

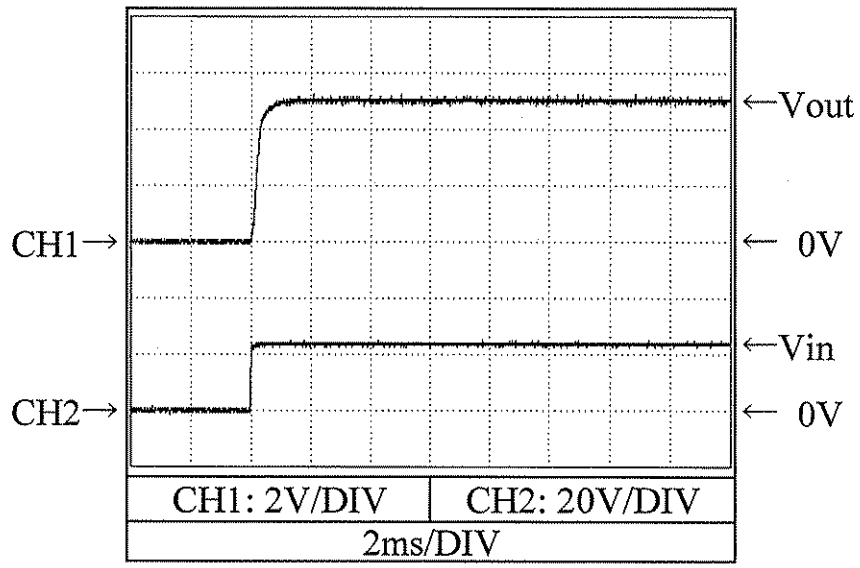


Conditions Vin : 24 VDC
Iout : 100 %
Ta : 25 ℃

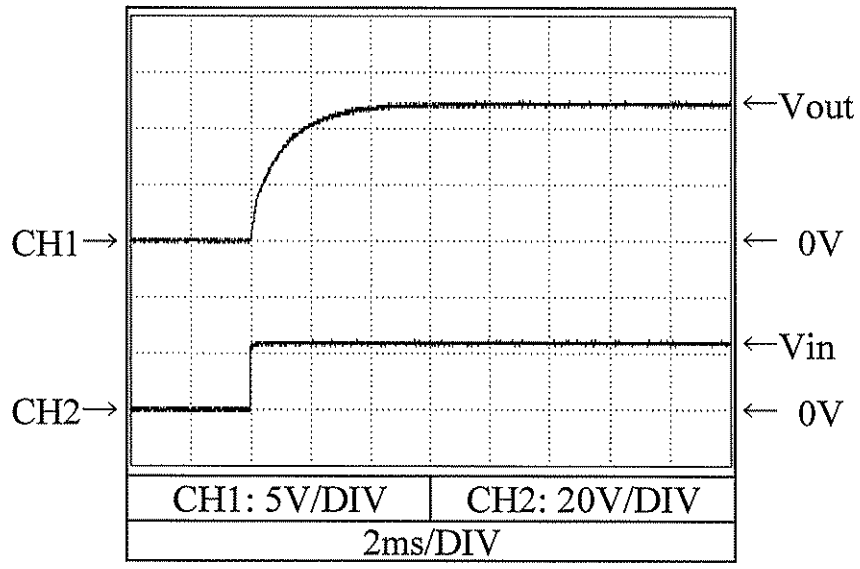
3.3V




5V




12V



Conditions Vin : 24 VDC
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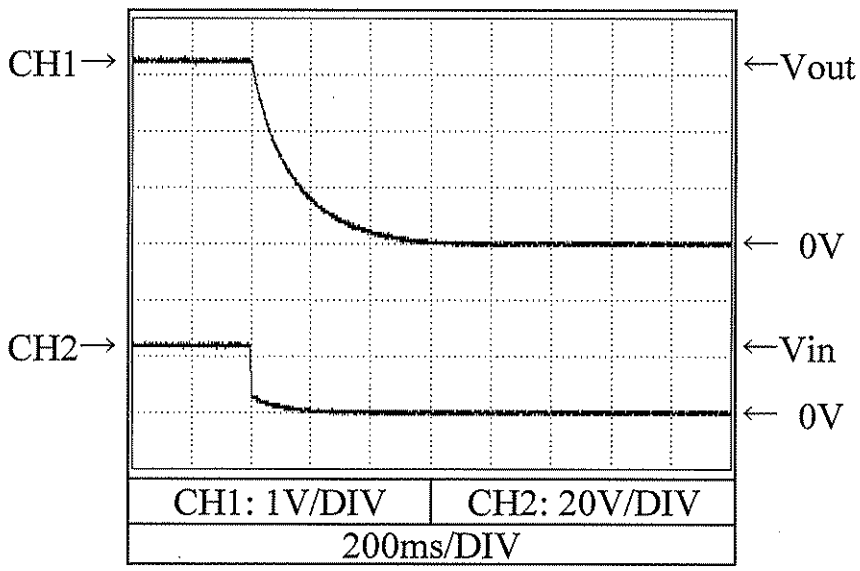
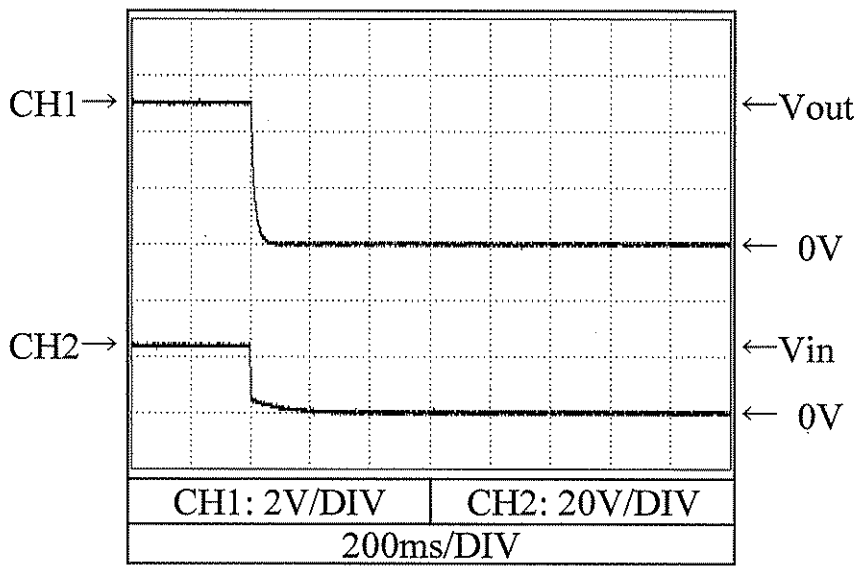
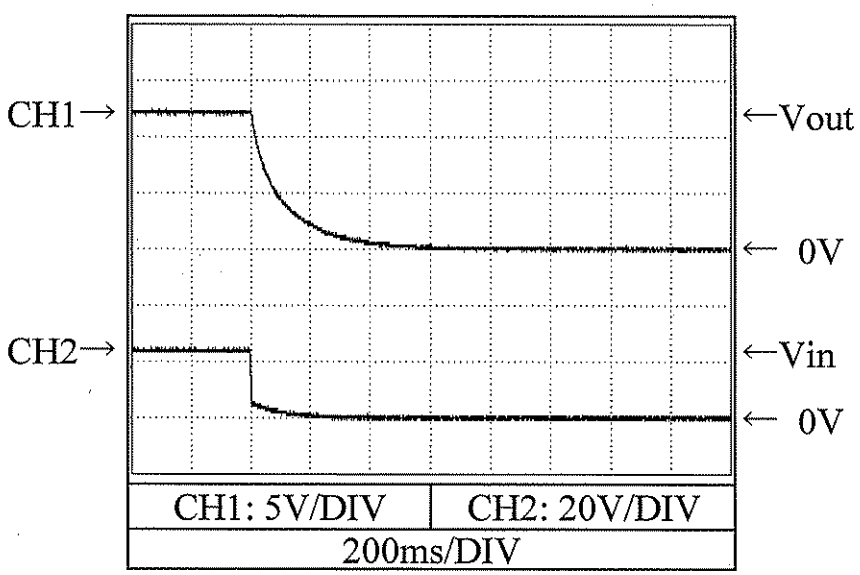
3.3V




5V

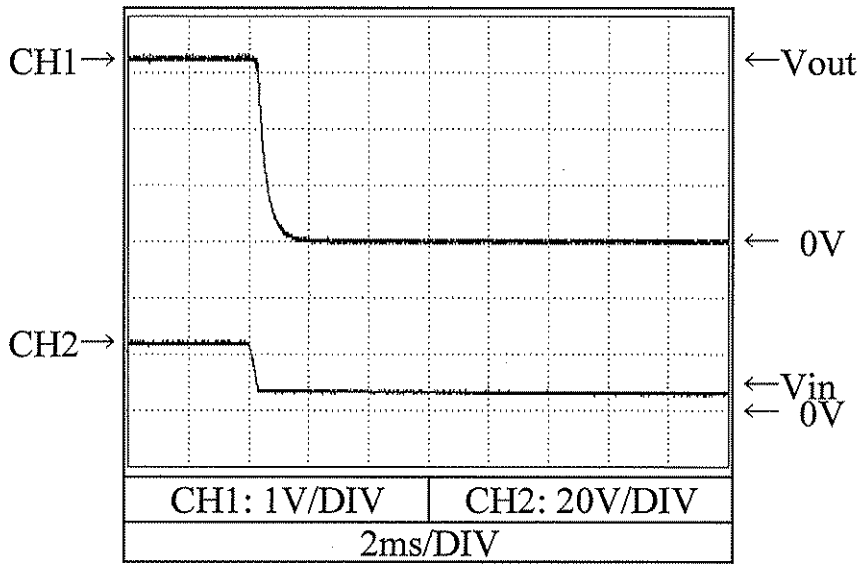



12V

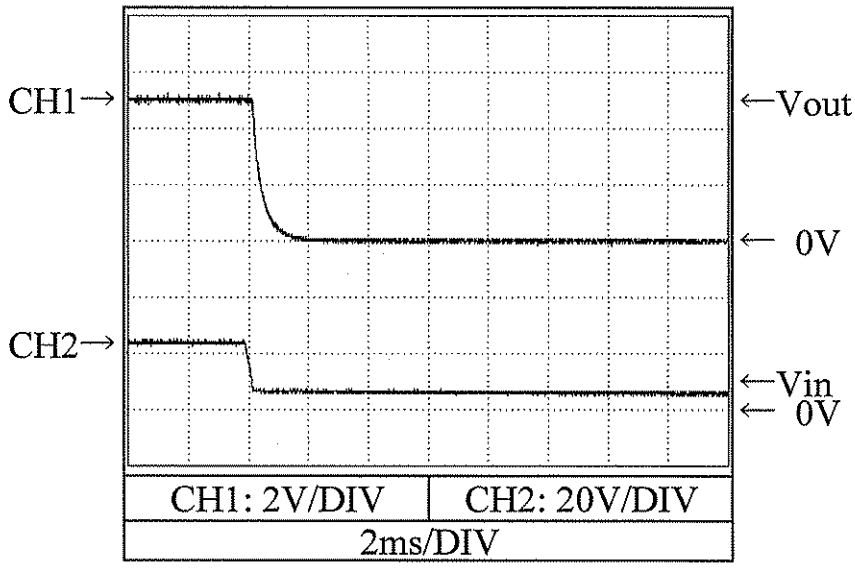


Conditions Vin : 24 VDC
Iout : 100 %
Ta : 25 ℃

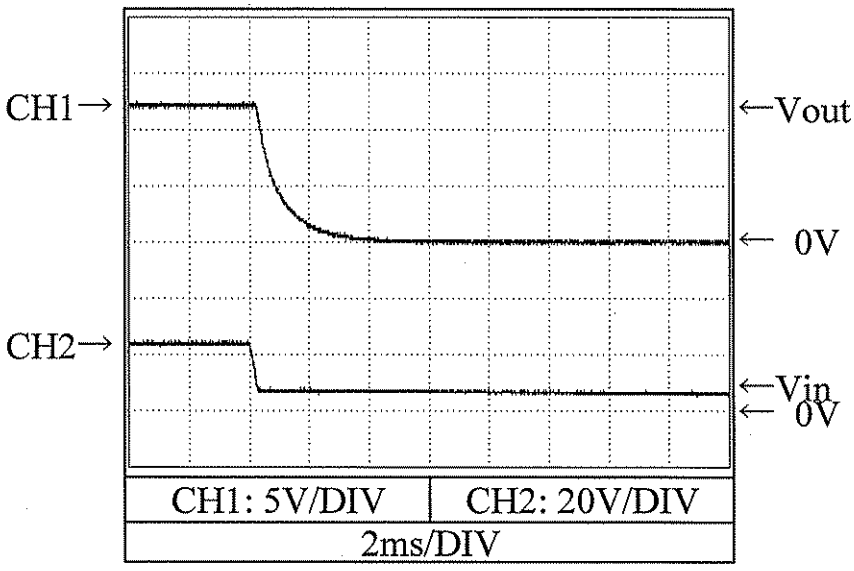
3.3V




5V



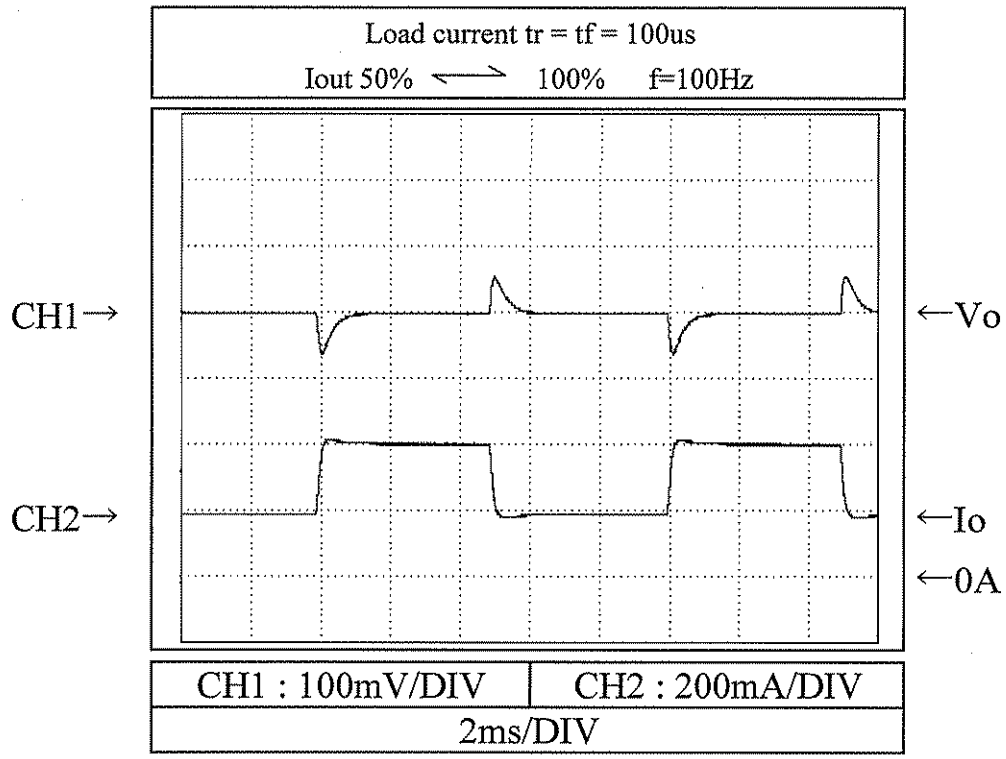

12V



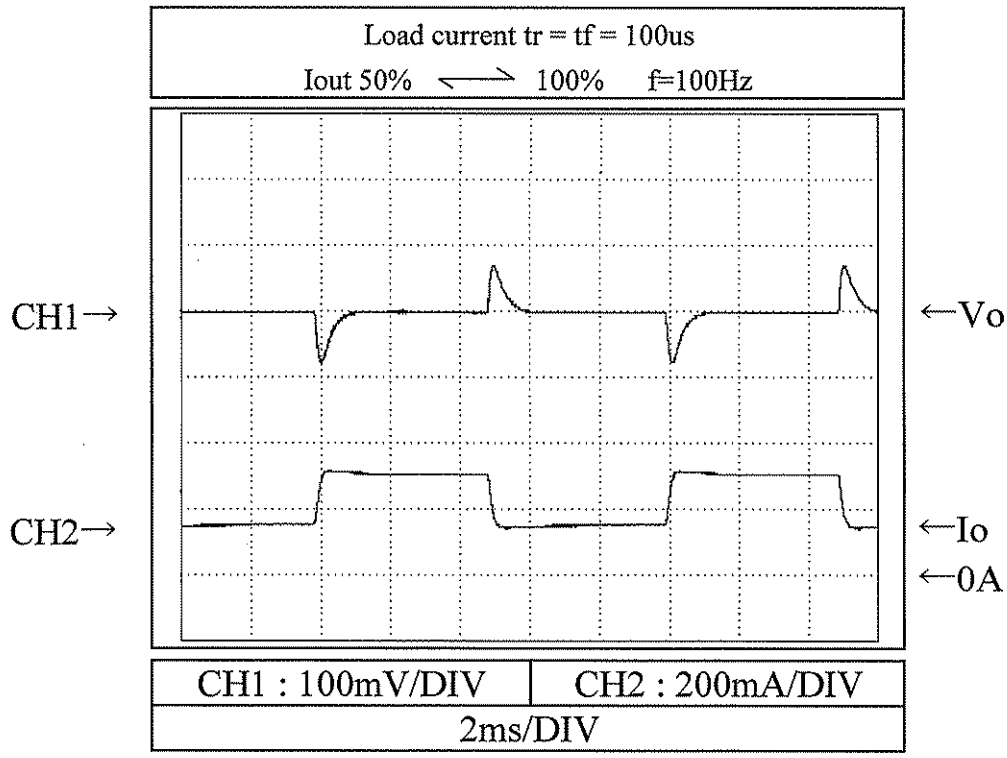
2.6 過渡応答（負荷急変）特性
Dynamic load response characteristics

Conditions Vin : 24 VDC
Ta : 25 ℃

3.3V



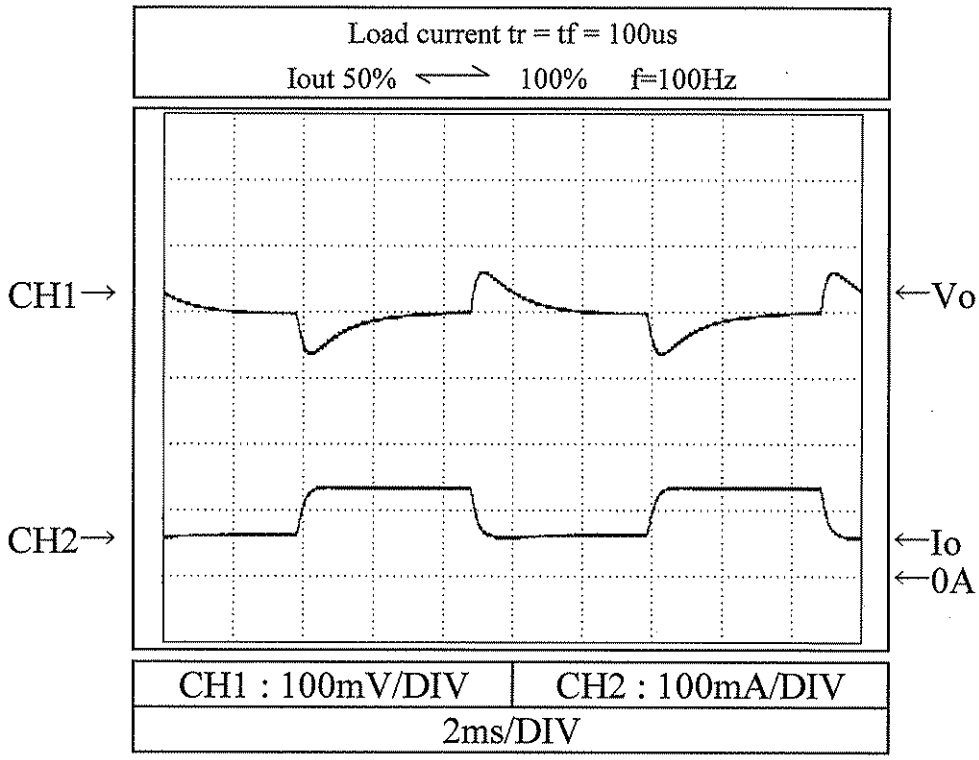

5V



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

Conditions Vin : 24 VDC
Ta : 25 ℃

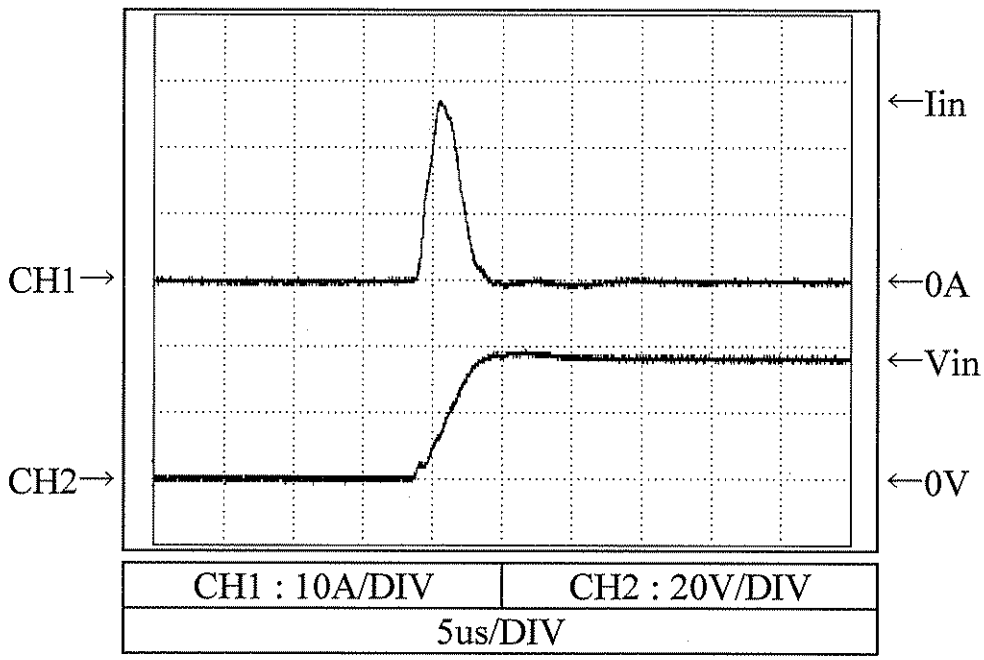
12V



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

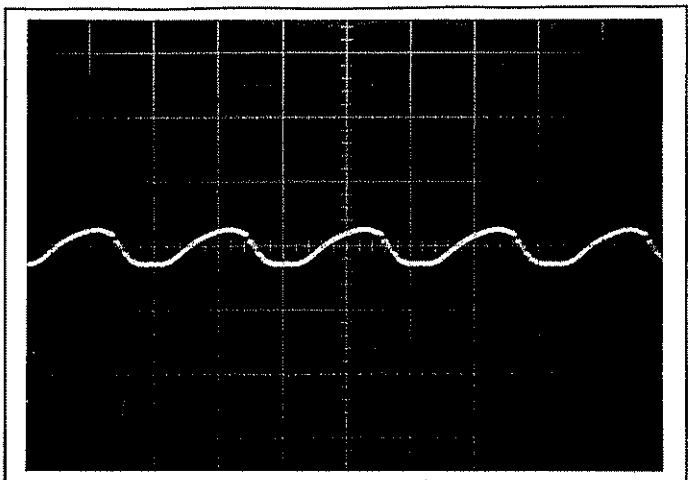
Conditions Vin : 36 VDC
Iout : 100 %
Ta : 25 ℃

5V



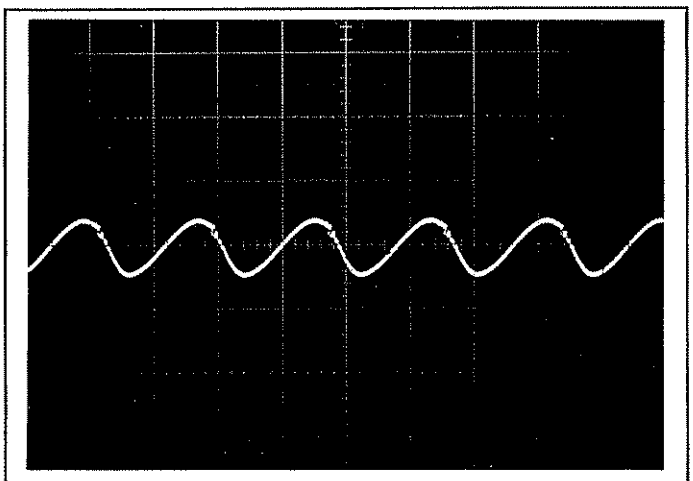
Conditions Vin : 24 VDC
Iout : 100 %
Ta : 25 ℃

3.3V



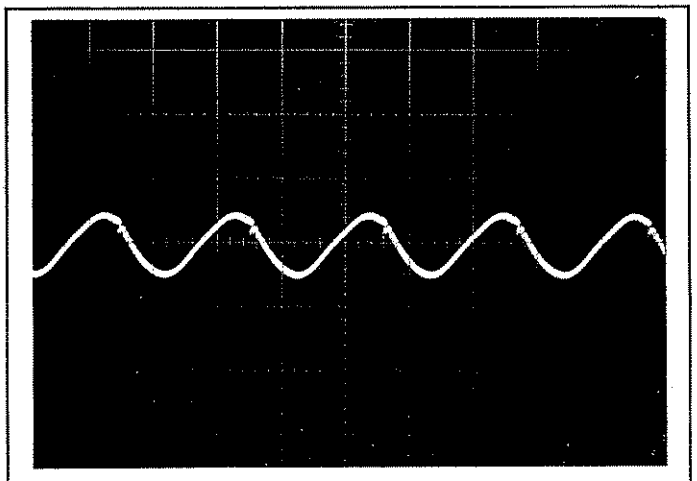
| 10mV/DIV | 2μs/DIV |
|---|---|
| 6mVp-p | |

5V



| 10mV/DIV | 2μs/DIV |
|---|---|
| 10mVp-p | |

12V



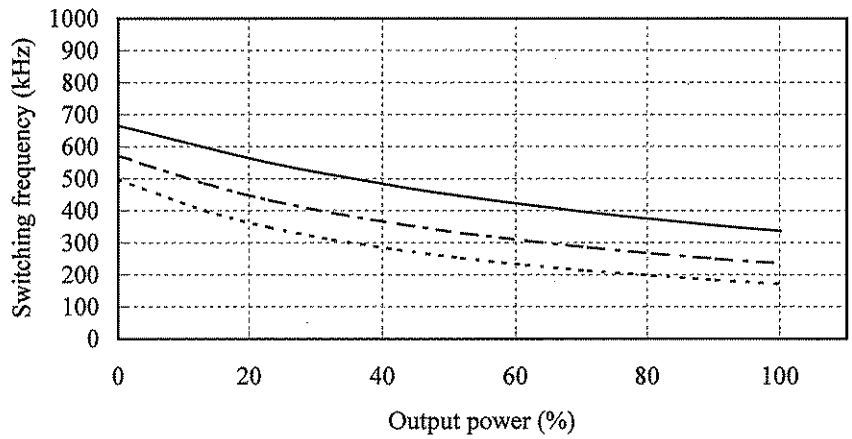
| 10mV/DIV | 2μs/DIV |
|---|---|
| 11mVp-p | |

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

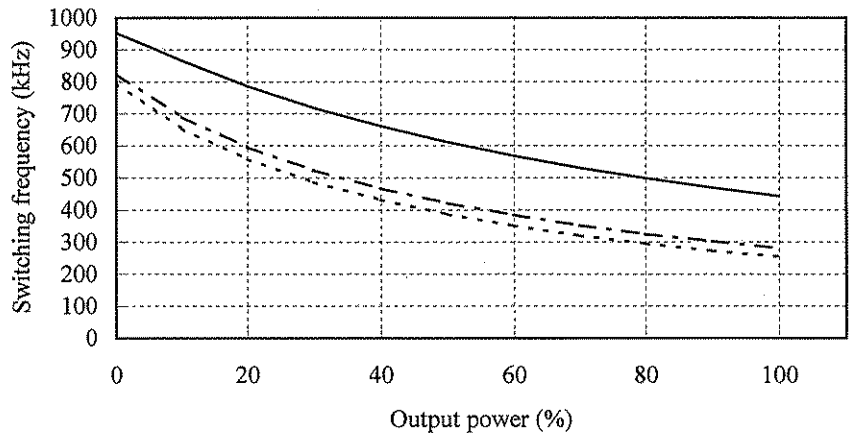
Conditions Vin : 18 VDC -------
24 VDC - - - - -
36 VDC ————

Ta : 25 ℃

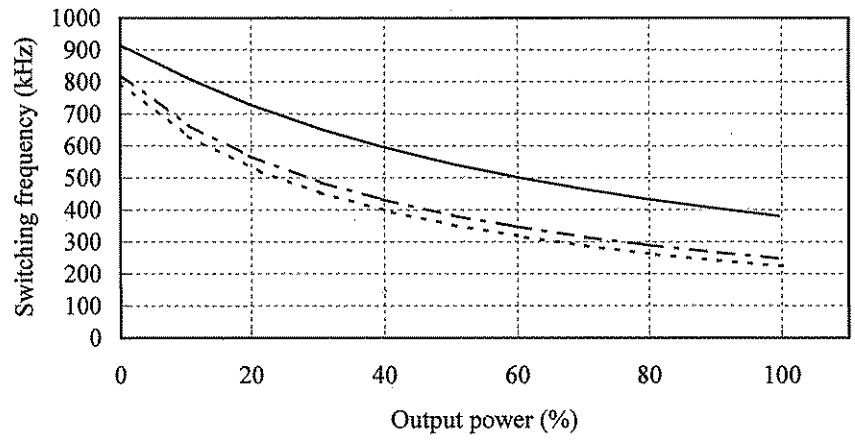
3.3V




5V




12V

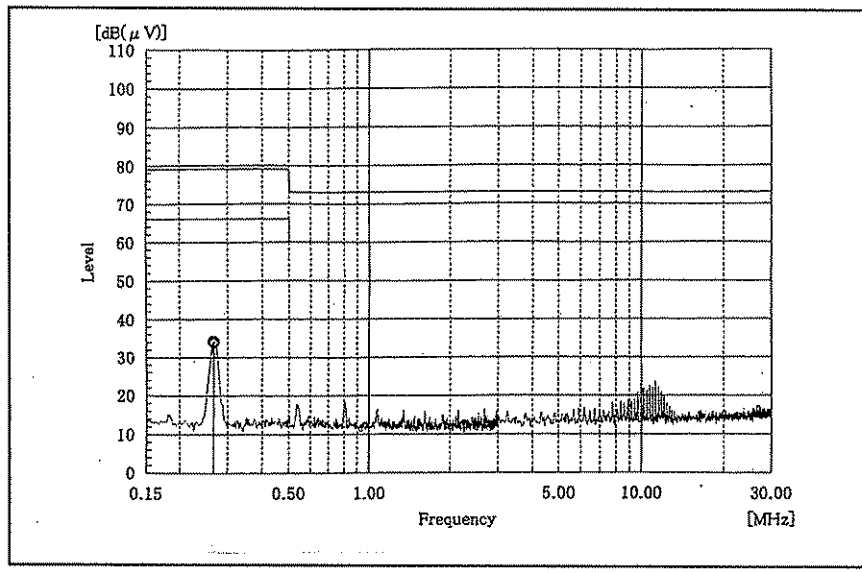


2.10 EMI特性
Electro-Magnetic Interference characteristics

(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 : 24 VDC
Iout : 100 %
Ta : 25 ℃

5V

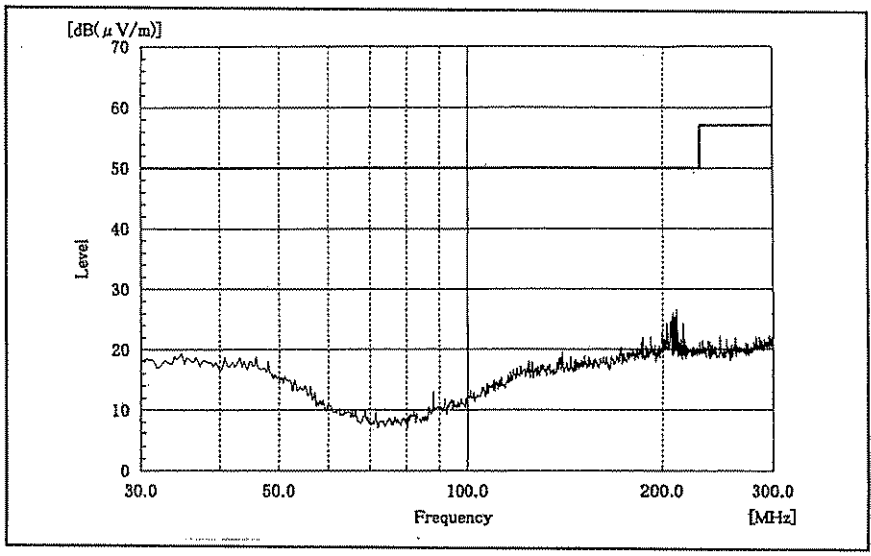


2. 10 EMI特性
Electro-Magnetic Interference characteristics
(b) 雑音電界強度（輻射ノイズ）
Radiated Emission
VCCI class A 対応アプリケーションシステム
VCCI class A application system

Conditions Vin : 24 VDC
Iout : 100 %
Ta : 25 ℃

5V

HORIZONTAL:




VERTICAL: