

PAH350S24-*

EVALUATION DATA

型式データ

DWG.NO. C175-53-01/350			
承認	承認	査閲	担当
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<i>4. Nov. '03</i>	<i>30. Oct. '03</i>	<i>30. Oct. '03</i>	<i>29. Oct. '03</i>

DENSEI-LAMBDA

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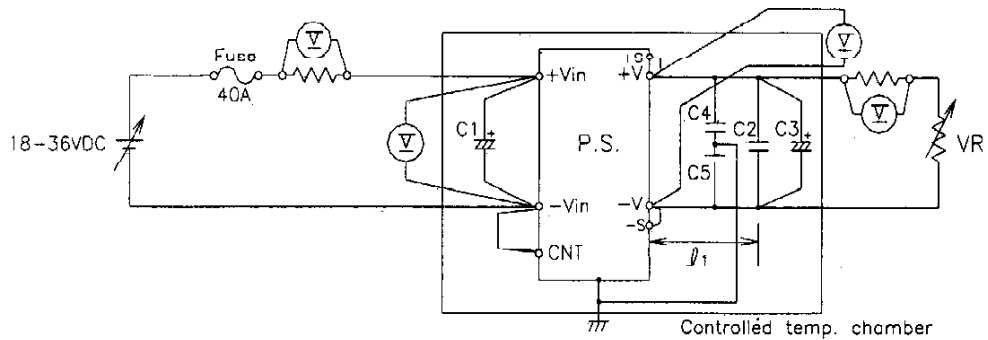
使用記号 Terminology used

	Definition	
Vin 入力電圧	Input Voltage
Vout 出力電圧	Output Voltage
Vcnt CNT電圧	CNT Voltage
Iin 入力電流	Input Current
Iout 出力電流	Output Current
Tbp ベースプレート温度	Baseplate Temperature

1. 測定方法 Evaluation Method

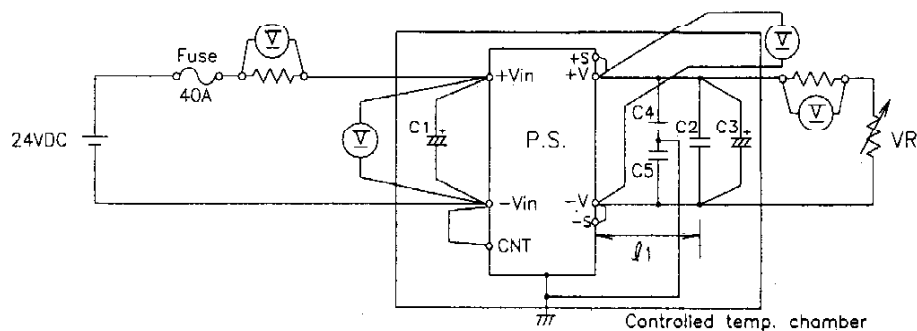
1.1 測定回路 Circuits used for determination

(1) 静特性 Steady state data



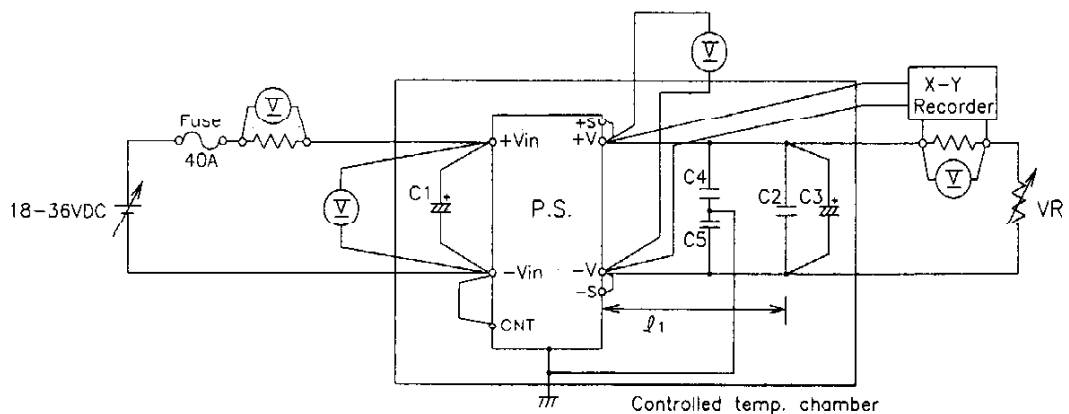
C1: 220uF Electrolytic Capacitor x 2para C3: 28V-220uF Electrolytic Capacitor I_1 : 50mm
 C2: 0.1uF Ceramic Capacitor C4,C5: 0.022uF Film Capacitor

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



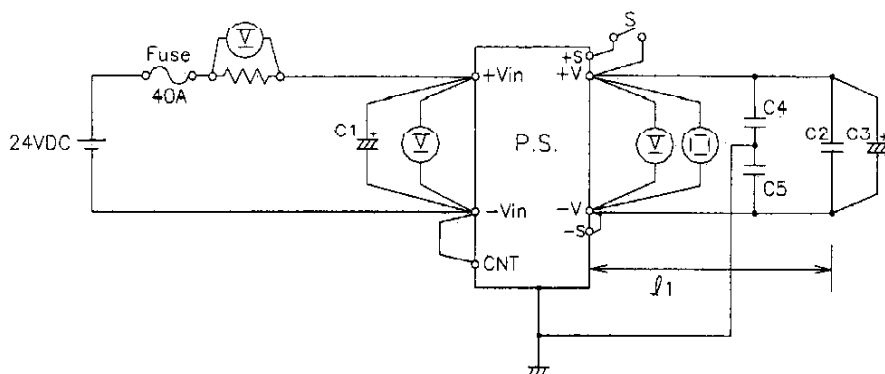
C1: 220uF Electrolytic Capacitor x 2para C3: 28V-220uF Electrolytic Capacitor I_1 : 50mm
 C2: 0.1uF Ceramic Capacitor C4,C5: 0.022uF Film Capacitor

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



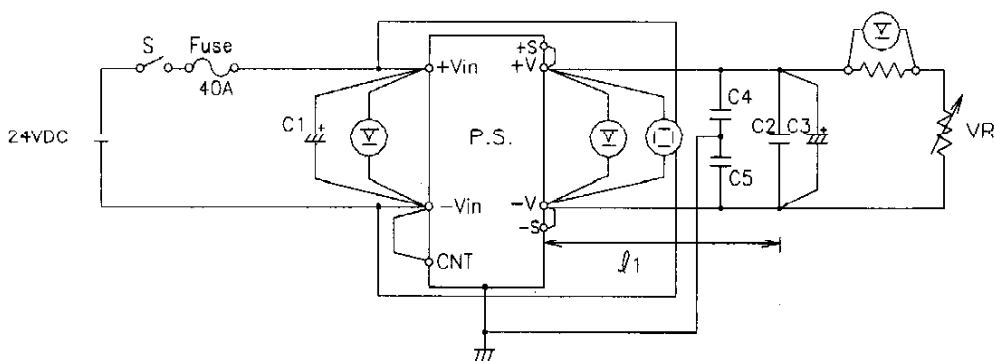
C1: 220uF Electrolytic Capacitor x 2para C3: 28V-220uF Electrolytic Capacitor I_1 : 50mm
 C2: 0.1uF Ceramic Capacitor C4,C5: 0.022uF Film Capacitor

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



C1: 220uF Electrolytic Capacitor x 2para C3: 28V-220uF Electrolytic Capacitor l_1 : 50mm
 C2: 0.1uF Ceramic Capacitor C4,C5: 0.022uF Film Capacitor

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

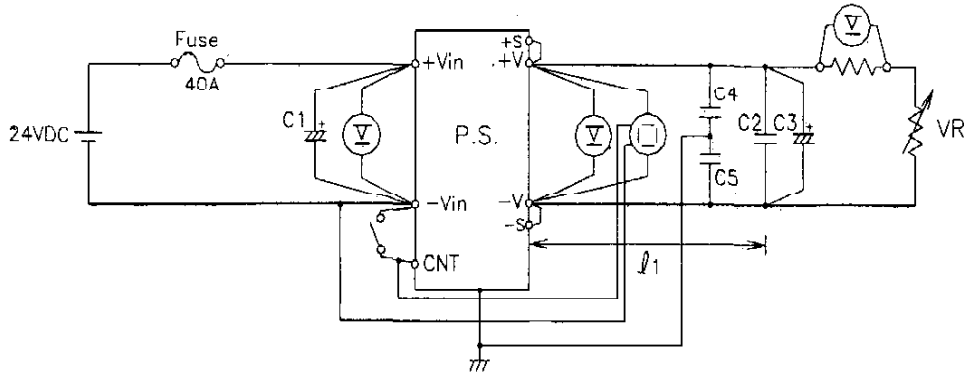


C1: 220uF Electrolytic Capacitor x 2para C3: 28V-220uF Electrolytic Capacitor l_1 : 50mm
 C2: 0.1uF Ceramic Capacitor C4,C5: 0.022uF Film Capacitor

(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

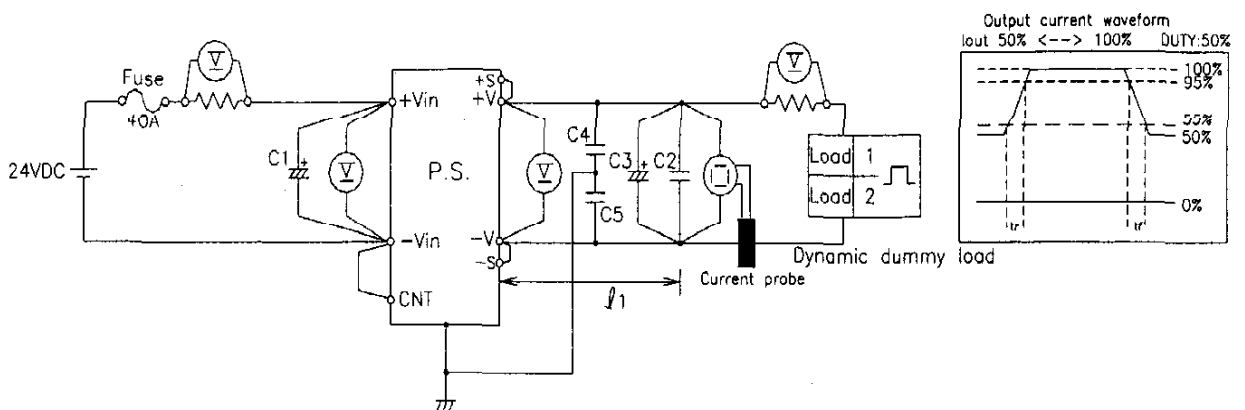


C1: 220uF Electrolytic Capacitor x 2para C3: 28V-220uF Electrolytic Capacitor l1: 50mm
C2: 0.1uF Ceramic Capacitor C4,C5: 0.022uF Film Capacitor

(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

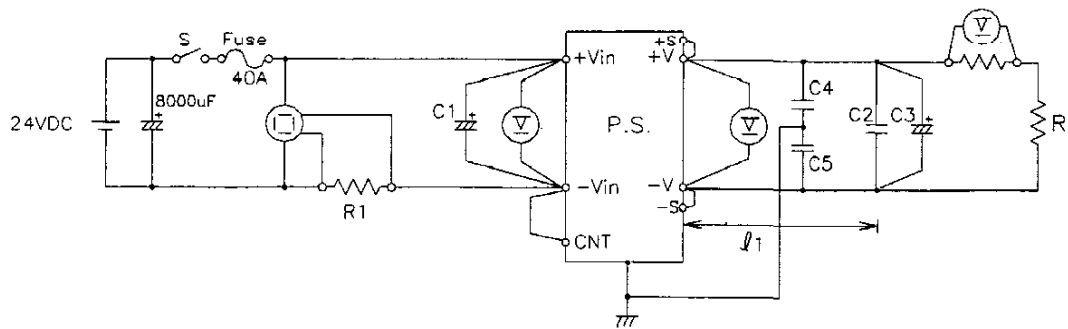
出力立ち上がり特性 (ON/OFFコントロール時) と同じ
Same as output rise characteristics with ON/OFF CONTROL

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



C1: 220uF Electrolytic Capacitor x 2para C3: 28V-220uF Electrolytic Capacitor l1: 50mm
C2: 0.1uF Ceramic Capacitor C4,C5: 0.022uF Film Capacitor

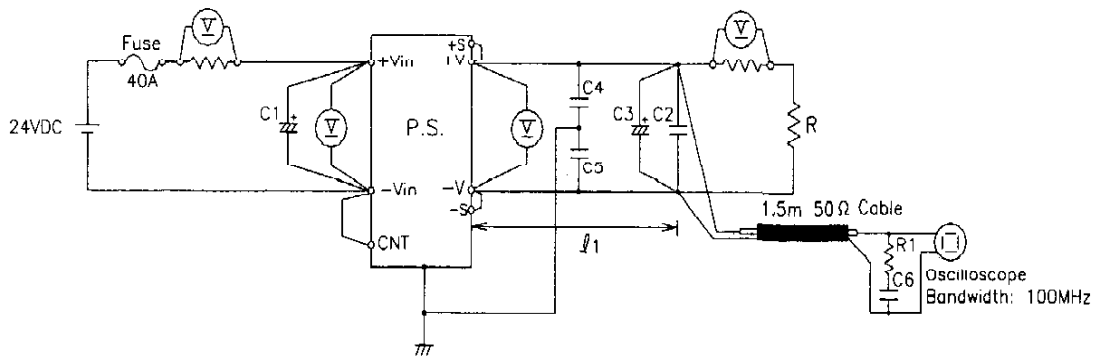
(10) 入力サージ電流 (突入電流) 特性 Inrush current characteristics



C1: 220uF Electrolytic Capacitor x 2para C3: 28V-220uF Electrolytic Capacitor R1: 0.01Ω
 C2: 0.1uF Ceramic Capacitor C4,C5: 0.022uF Film Capacitor I1: 50mm

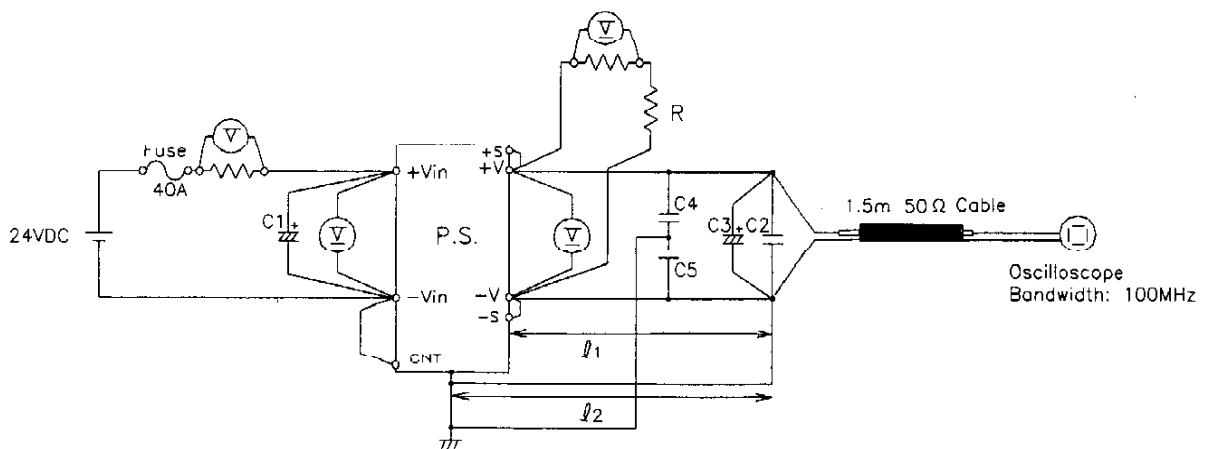
(11) 出力リップル、ノイズ波形 Output ripple and noise waveform

(a) Normal Mode



C1: 220uF Electrolytic Capacitor x 2para C3: 28V-220uF Electrolytic Capacitor C6: 4700pF Ceramic Capacitor
 C2: 0.1uF Ceramic Capacitor C4,C5: 0.022uF Film Capacitor R1: 50 Ω
 I1: 50mm

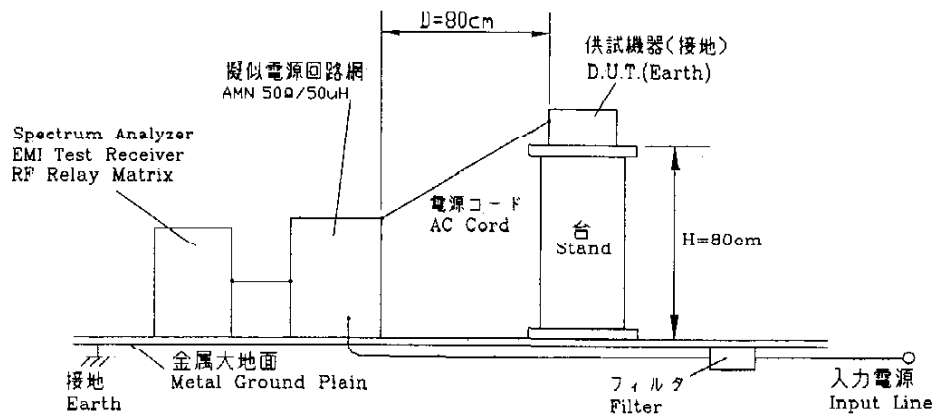
(b) Normal + Common Mode



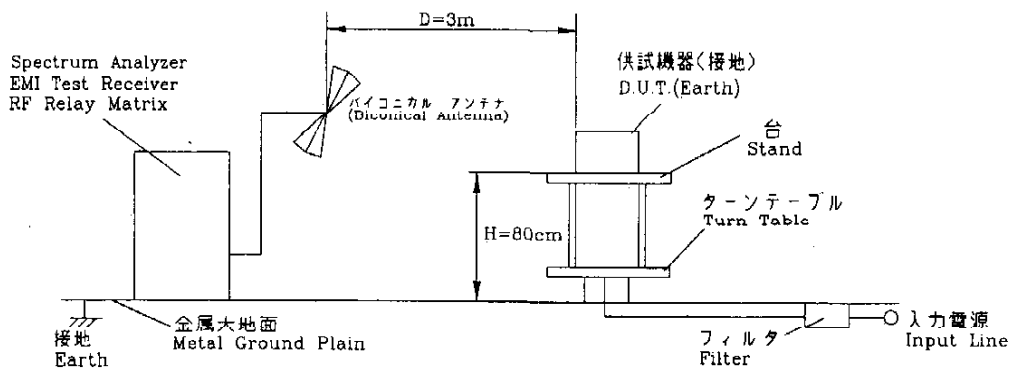
C1: 220uF Electrolytic Capacitor x 2para C3: 28V-220uF Electrolytic Capacitor I1, I2: 50mm
 C2: 0.1uF Ceramic Capacitor C4,C5: 0.022uF Film Capacitor

(12) EMI 特性 Electro-Magnetic Interference characteristics

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

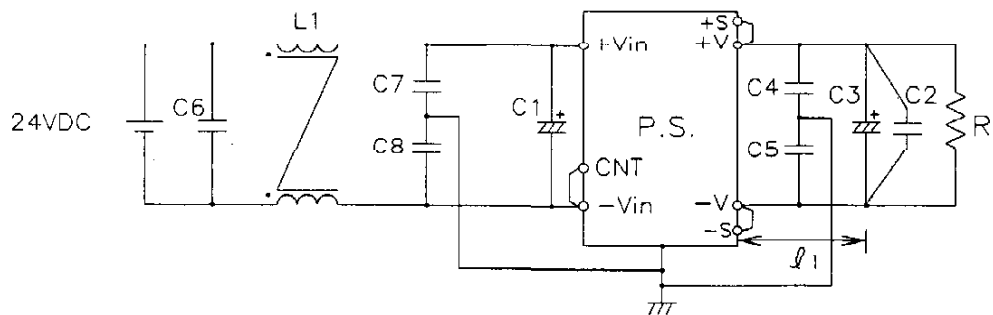


(b) 雑音電界強度 (輻射ノイズ) Radiated Emission Noise



(1) VCC class A 対応対応アプリケーションシステム

VCCI class A application system



- | | |
|---|-----------------------------------|
| C1 : 680uF Electrolytic Capacitor x 3para | C4,C5 : 0.022uF Ceramic Capacitor |
| C2 : 0.1uF Ceramic Capacitor | C6 : 10uF Ceramic Capacitor |
| C3 : 28V-220uF Electrolytic Capacitor | C7,C8 : 0.47uF Film Capacitor |
| L1 : 1mH | |
| ℓ1 : 50mm | |

1.2 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	OSCILLOSCOPE	HITACHI DENSHI	V-1100A
2	DIGITAL STORAGE OSCILLOSCOPE	IWATSU-LECROY	LT364L
3	DIGITAL MULTIMETER	ADVANTEST	R6441B
4	DATA ACQUISITION / SWITCH UNIT	AGILENT	34970A
5	CURRENT PROBE	LECROY	AP015
6	SHUNT RESISTER	YOKOGAWA ELECT.	2215
7	X-Y RECORDER	GRAPHTEC	WX3000
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-408
14	ANTENNA(BICONICAL ANTENNA)	SCHWARZBECK	BBA9106
15	DYNAMIC DUMMY LOAD	TAKASAGO	FK-600L
16	DC POWER SUPPLY	TAKASAGO	EX-1500L

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

28V

1. Regulation - line and load

condition Tbp : 25°C

Iout \ Vin	18VDC	24VDC	36VDC	line regulation	
0%	27.947V	27.946V	27.946V	1mV	0.004%
50%	27.948V	27.948V	27.947V	1mV	0.004%
100%	27.949V	27.949V	27.949V	0mV	0.000%
load regulation	2mV	3mV	1mV		
	0.007%	0.011%	0.004%		

2. Temperature drift

conditions Vin : 24VDC

Iout : 100%

Tbp	-40°C	25°C	100°C	temperature stability	
Vout	28.031V	27.949V	27.861V	170mV	0.607%

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

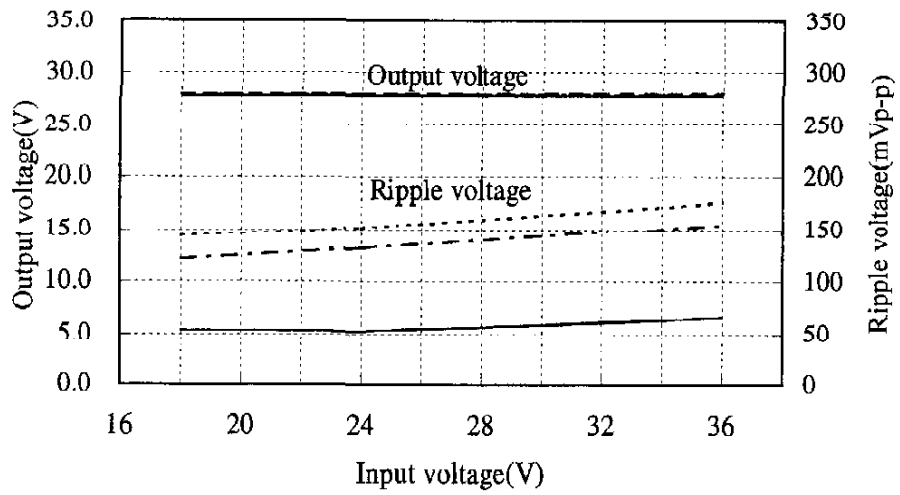
Conditions Iout : 100 %

Tbp : -40 °C -----

25 °C - - - - -

100 °C _____

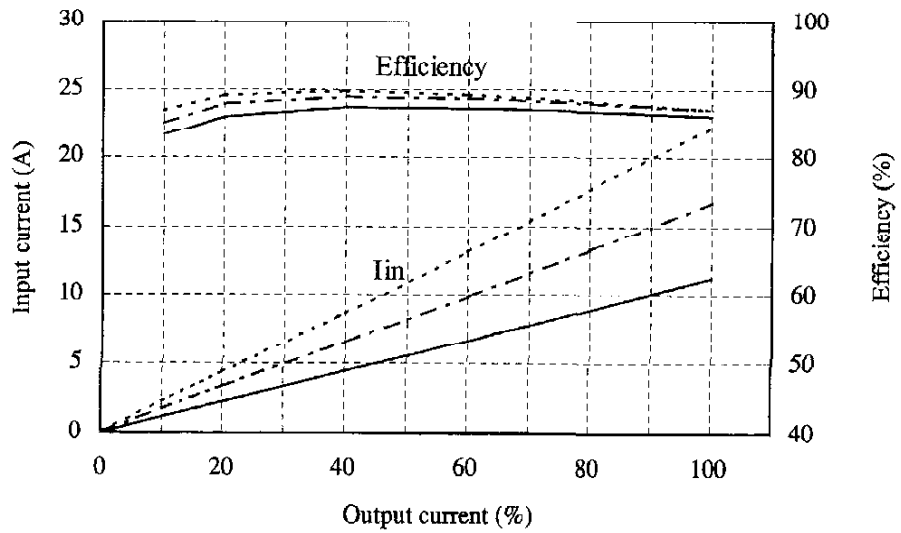
28V



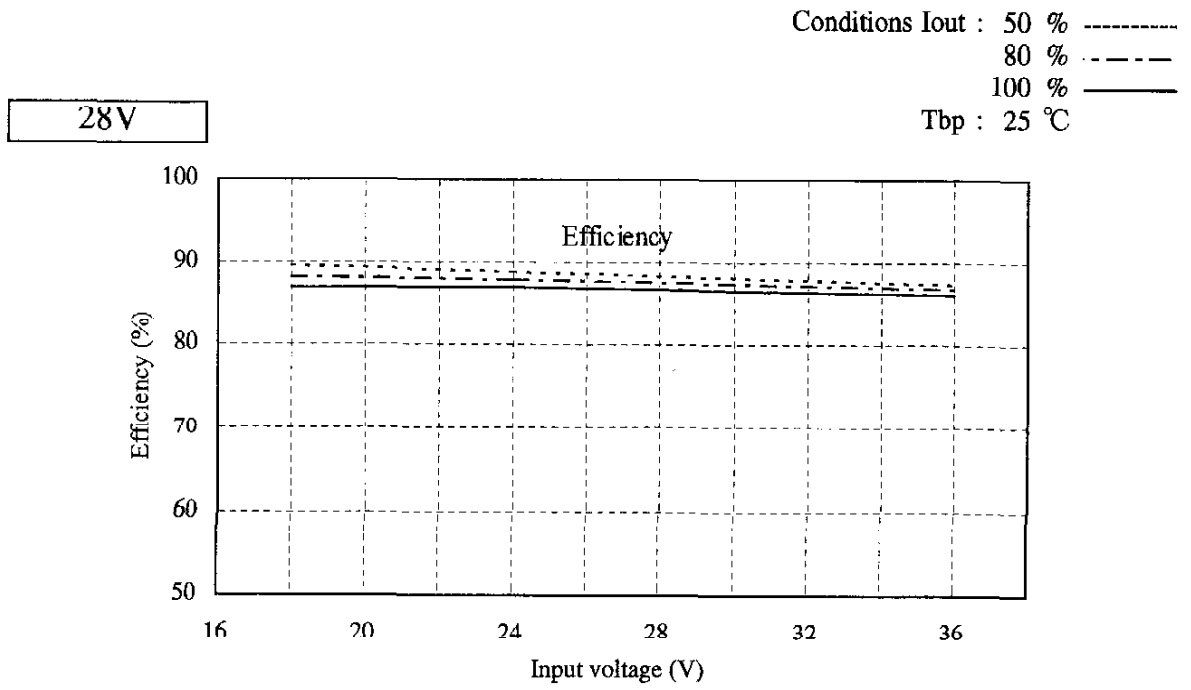
2.1 (3) 効率・入力電流対出力電流
 Efficiency and input current v.s. output current

28V

Conditions Vin : 18 VDC -----
 : 24 VDC - - - - -
 : 36 VDC ————
 Tbp : 25 °C



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

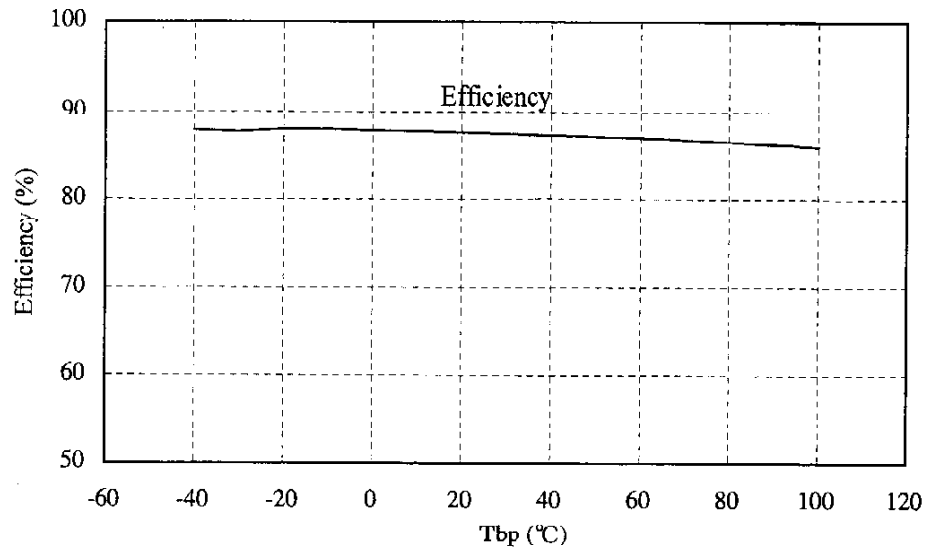


2.1 (5) 効率対ベースプレート温度
Efficiency v.s. Baseplate temperature

Conditions Vin : 24 VDC

Iout : 100 %

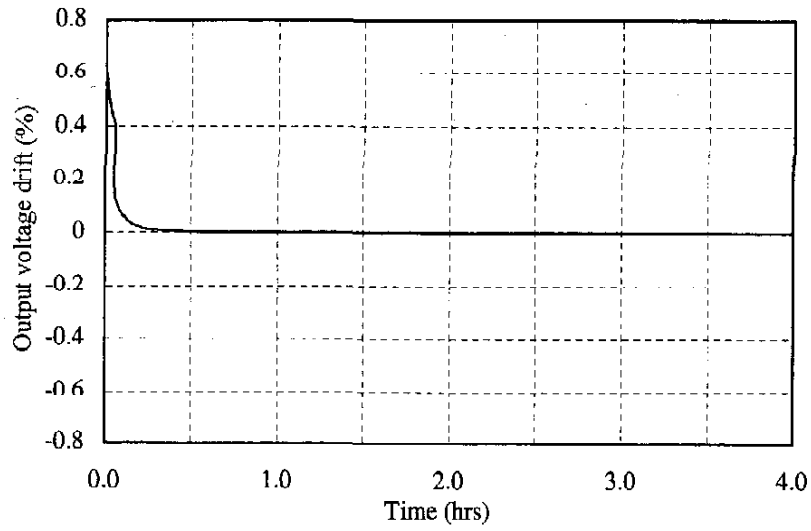
28V



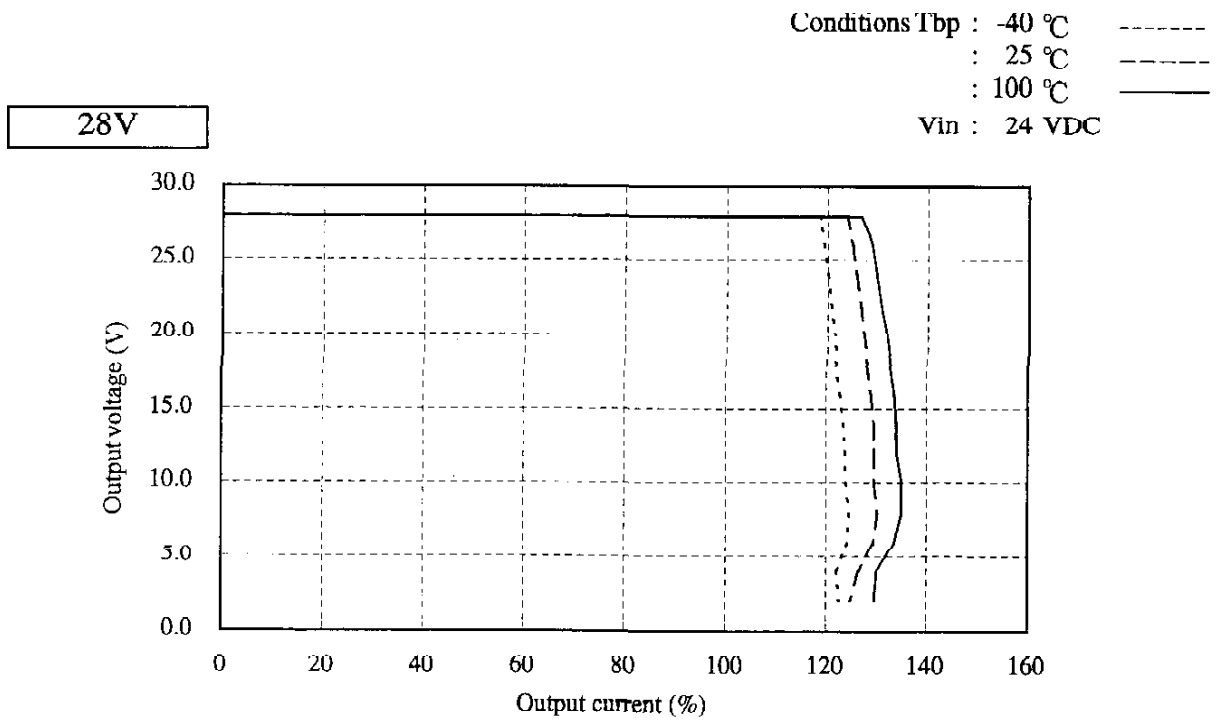
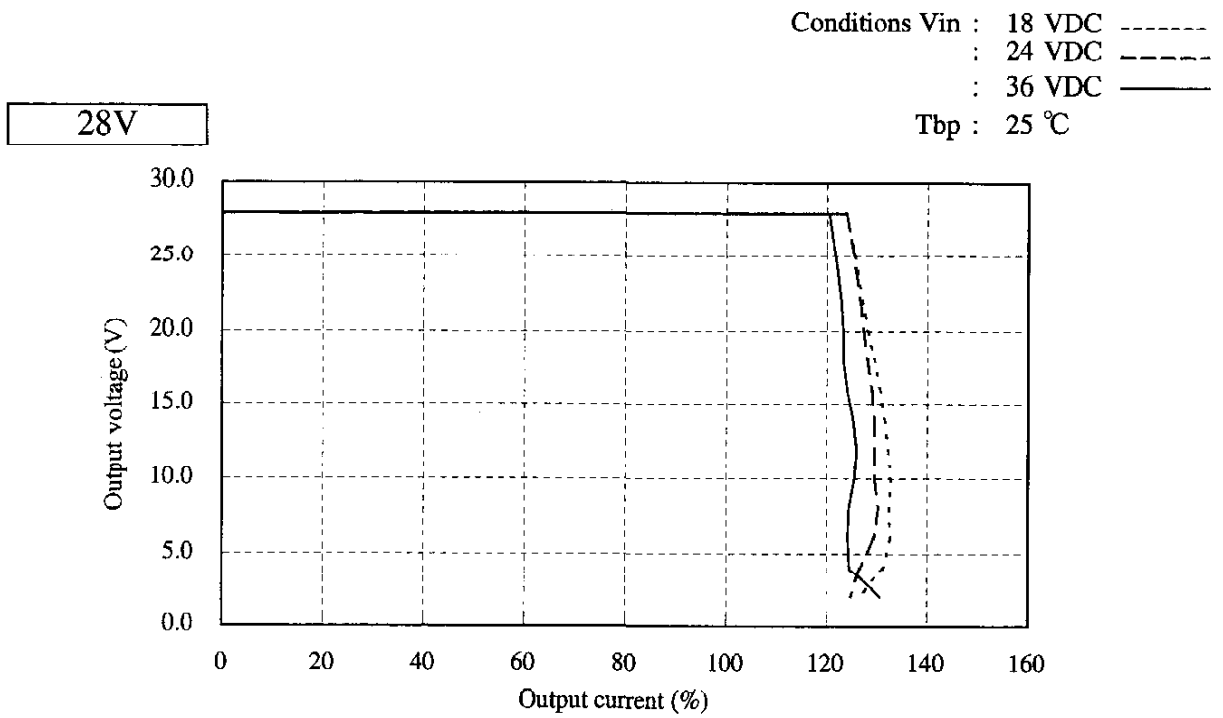
2.2 通電ドリフト特性
Warm up voltage drift characteristics

Conditions Vin : 24 VDC
Iout : 100 %
Ta : 25 °C

28V



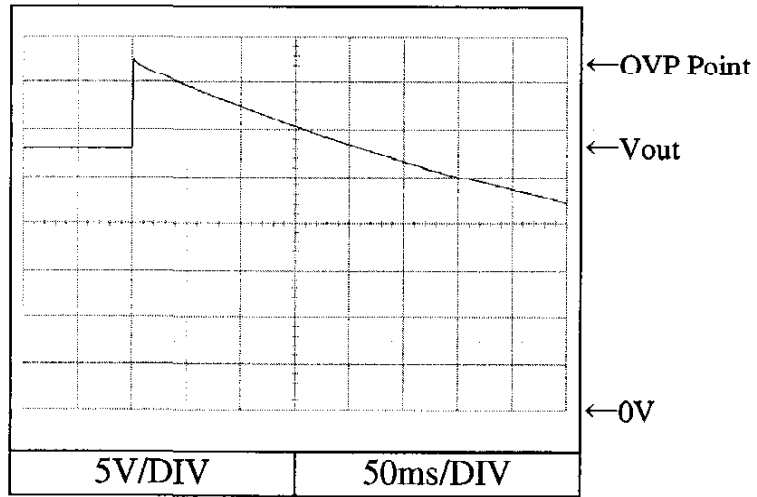
2.3 過電流保護特性
Over current protection (OCP) characteristics



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

Conditions Vin : 24 VDC
Iout : 0 %
Tbp : 25 °C

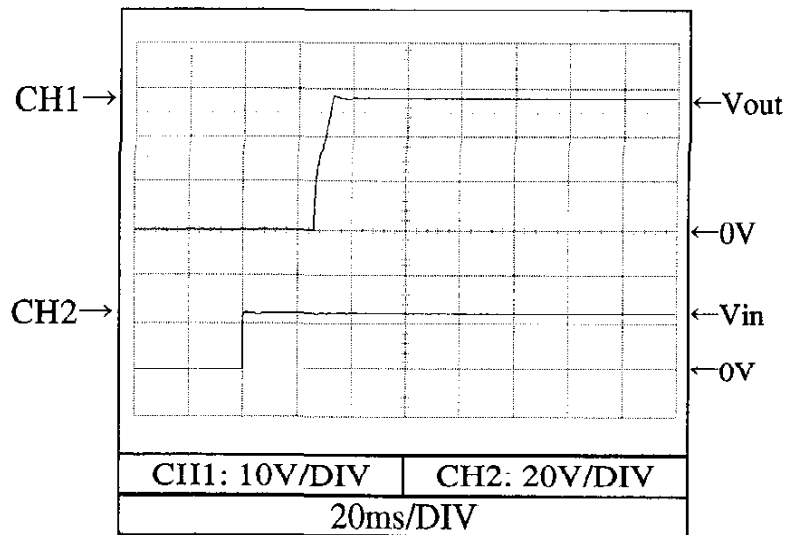
28V



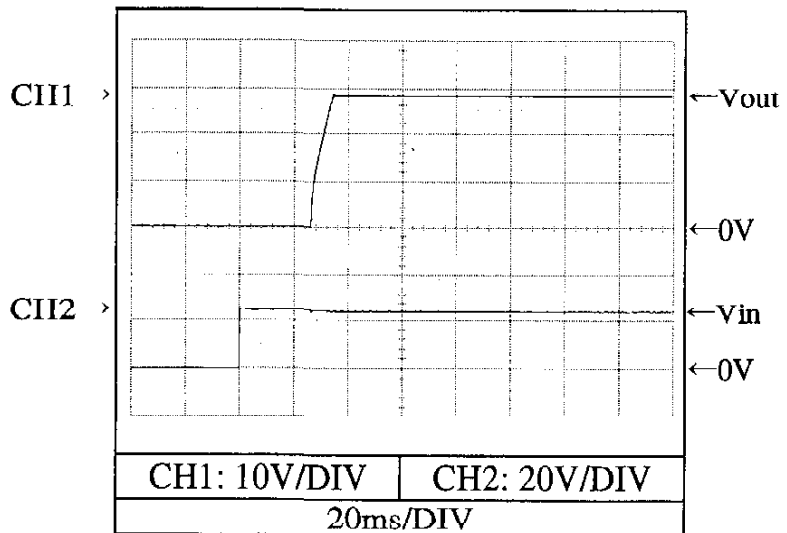
2.5 出力立ち上がり特性
Output rise characteristics

28V

Conditions Vin : 24 VDC
Iout : 0 %
Tbp : 25 °C



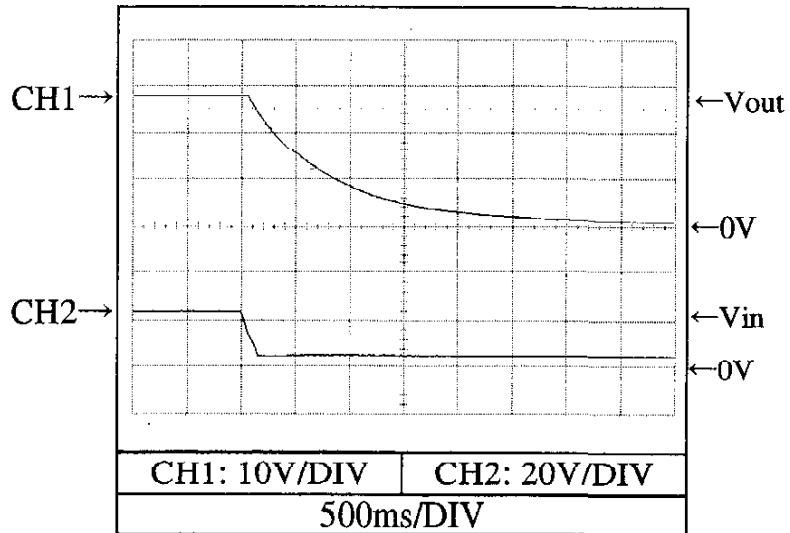
Conditions Vin : 24 VDC
Iout : 100 %
Tbp : 25 °C



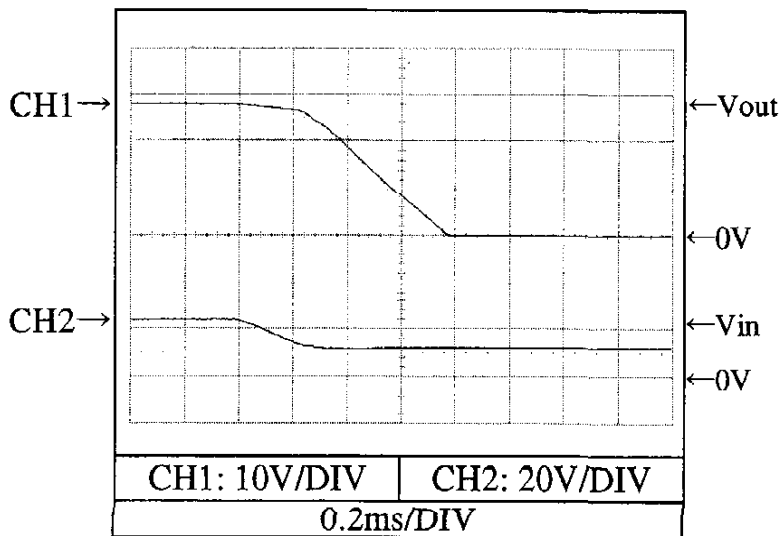
2.6 出力立ち下がり特性
Output fall characteristics

28V

Conditions Vin : 24 VDC
Iout : 0 %
Tbp : 25 °C



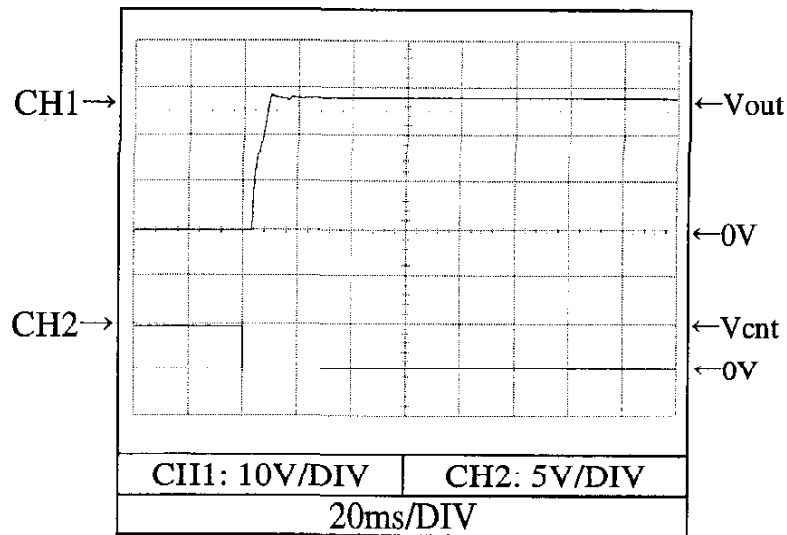
Conditions Vin : 24 VDC
Iout : 100 %
Tbp : 25 °C



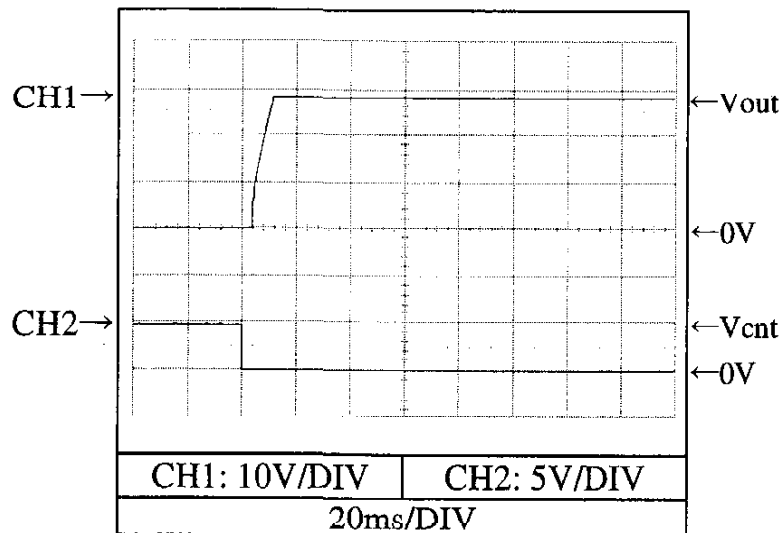
2.7 出力立ち上がり特性 (ON/OFFコントロール時)
Output rise characteristics with ON/OFF CONTROL

28V

Conditions V_{in} : 24 VDC
 I_{out} : 0 %
 T_{bp} : 25 °C



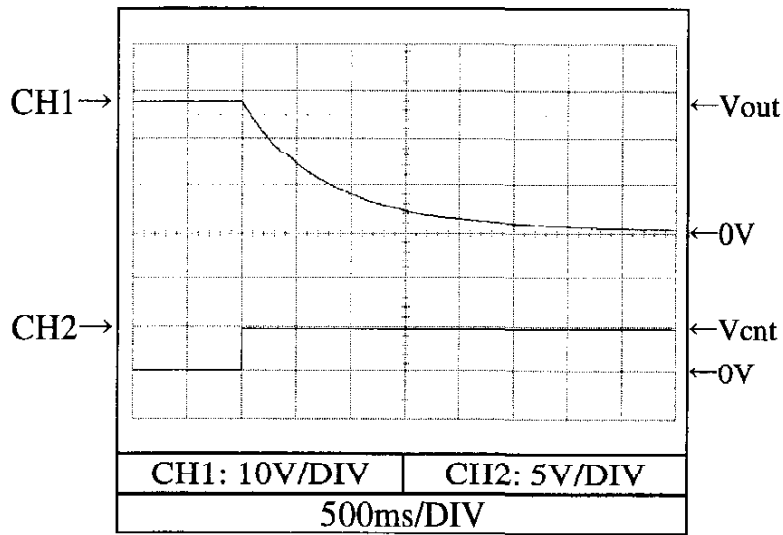
Conditions V_{in} : 24 VDC
 I_{out} : 100 %
 T_{bp} : 25 °C



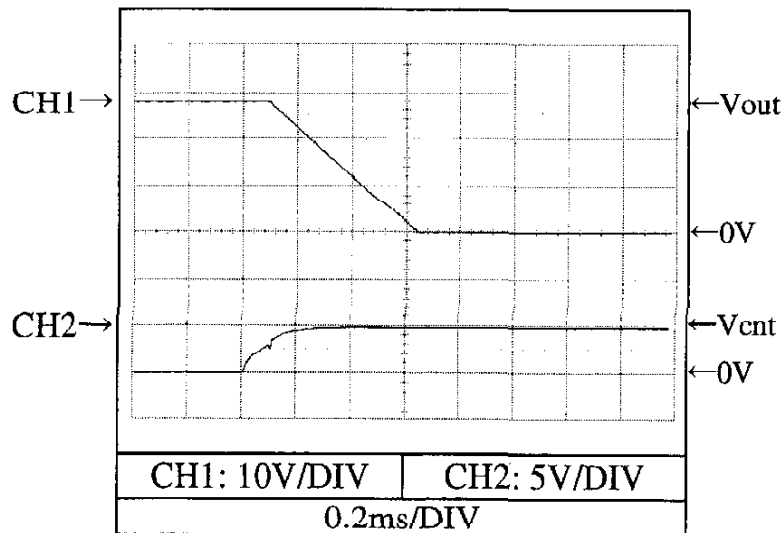
2.8 出力立ち下がり特性 (ON/OFFコントロール時)
Output fall characteristics with ON/OFF CONTROL

28V

Conditions Vin : 24 VDC
Iout : 0 %
Tbp : 25 °C



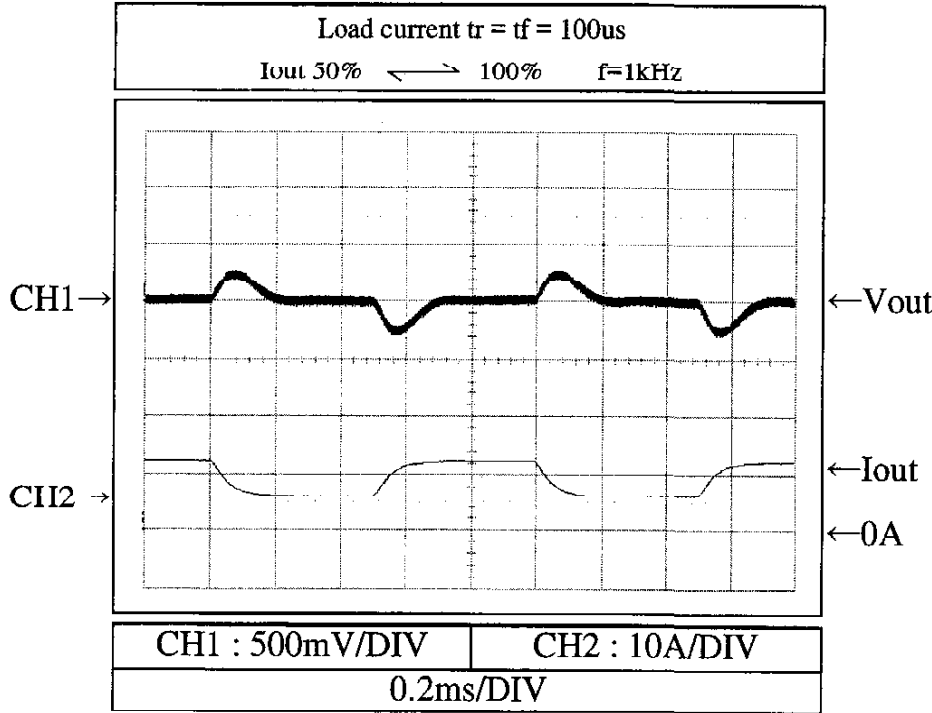
Conditions Vin : 24 VDC
Iout : 100 %
Tbp : 25 °C



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

Conditions Vin : 24 VDC
Tbp : 25 °C

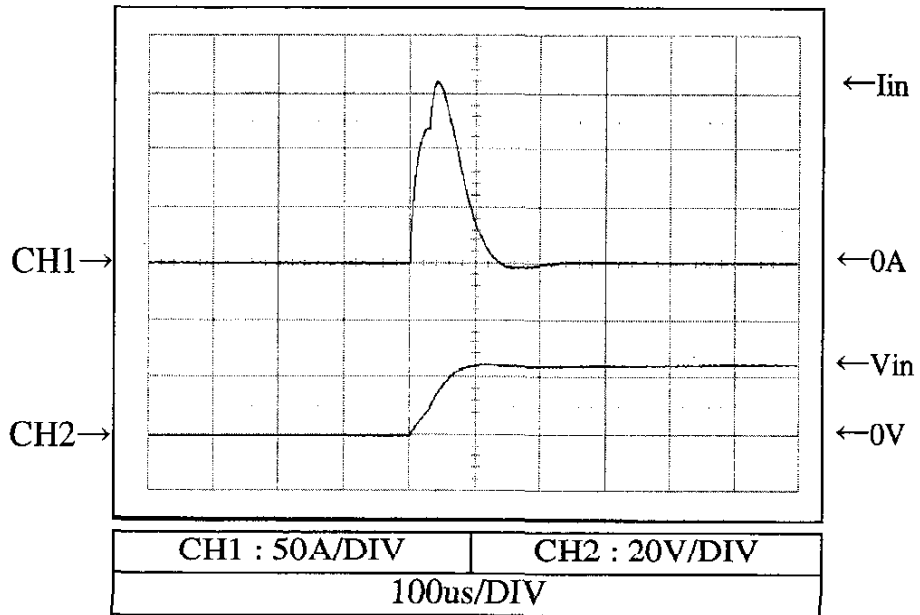
28V



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

Conditions Vin : 24 VDC
Iout : 100 %
Tbp : 25 °C

28V

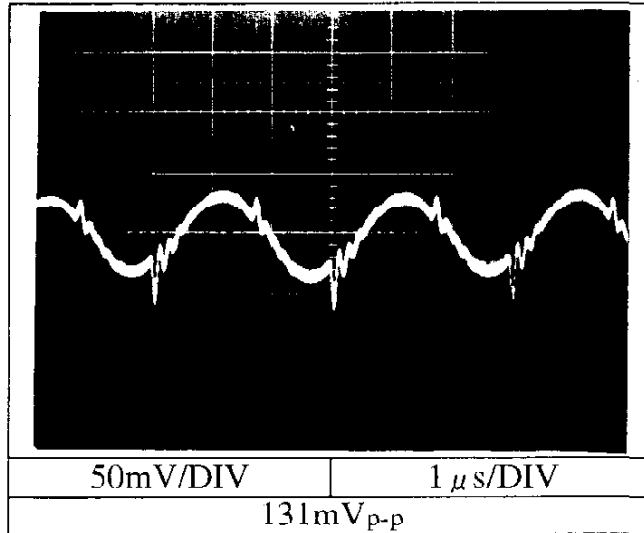


2.11 出力リップル、ノイズ波形
Output ripple and noise waveform

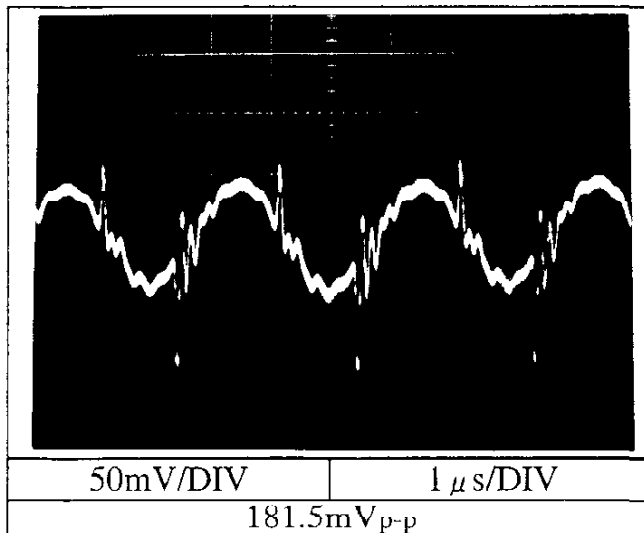
Conditions V_{in} : 24 VDC
 I_{out} : 100 %
 T_{bp} : 25 °C

28V

Normal mode



Normal + common mode



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

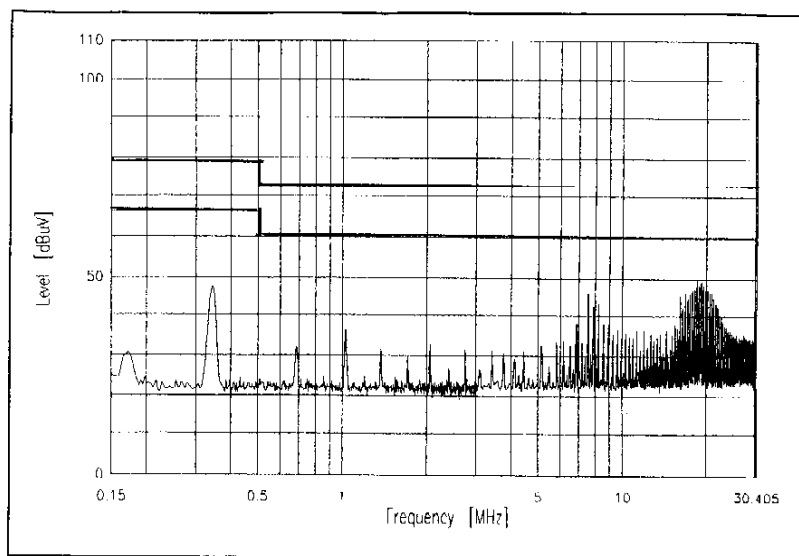
VCCI class A application system

Conditions Vin : 24 VDC

Iout : 100 %

Tbp : 25 °C

28V



VCCI class A
QP Limit

VCCI class A
AV Limit

2.12 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

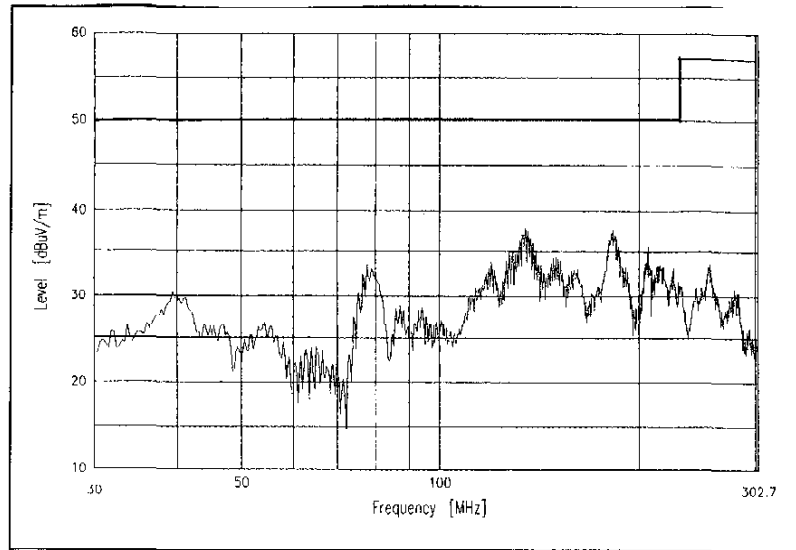
Conditions Vin : 24 VDC

Iout : 100 %

Tbp : 25 °C

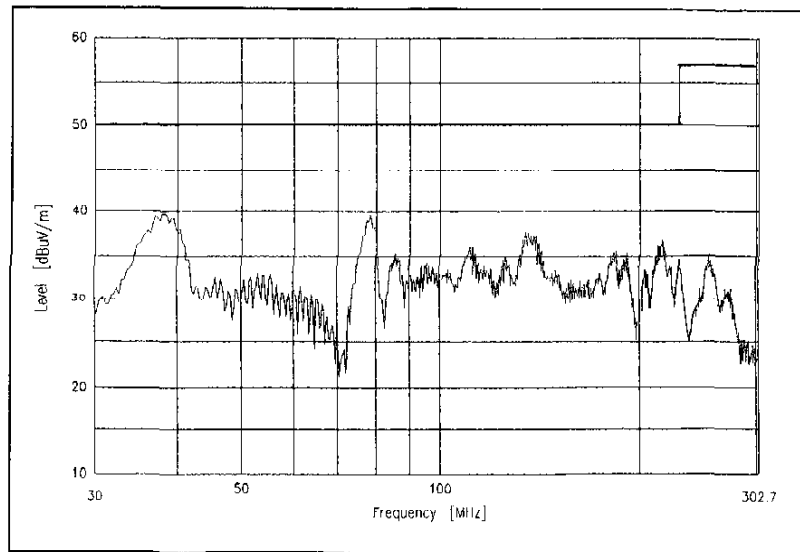
28V

HORIZONTAL:



VCCI classA
QP Limit

VERTICAL:



VCCI classA
QP Limit