

# **HWS1000**

## **EVALUATION DATA**

### **型式データ**

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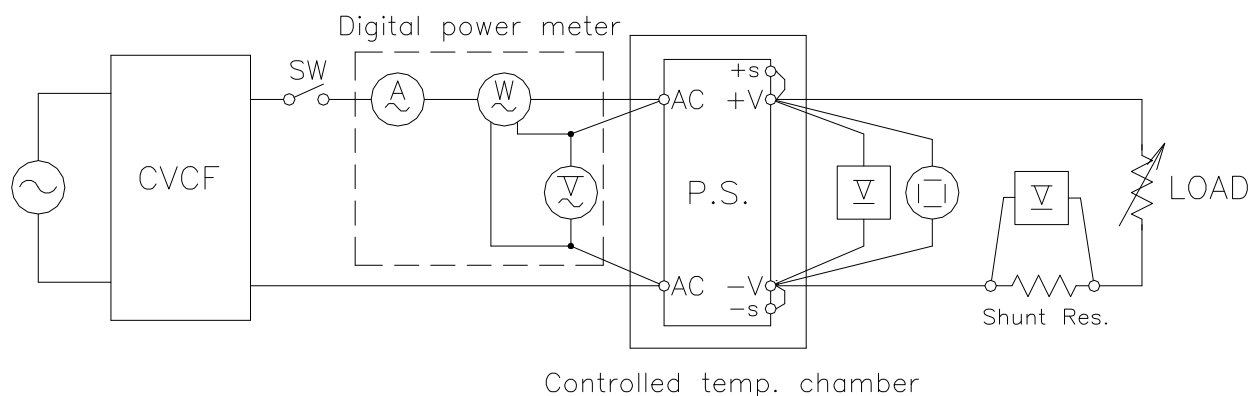
#### 使用記号 Terminology used

	Definition	
V <sub>in</sub>	..... 入力電圧	Input voltage
V <sub>out</sub>	..... 出力電圧	Output voltage
I <sub>in</sub>	..... 入力電流	Input current
I <sub>out</sub>	..... 出力電流	Output current
T <sub>a</sub>	..... 周囲温度	Ambient temperature
f	..... 周波数	Frequency

## 1. 測定方法 Evaluation Method

### 1.1 測定回路 Circuit used for determination

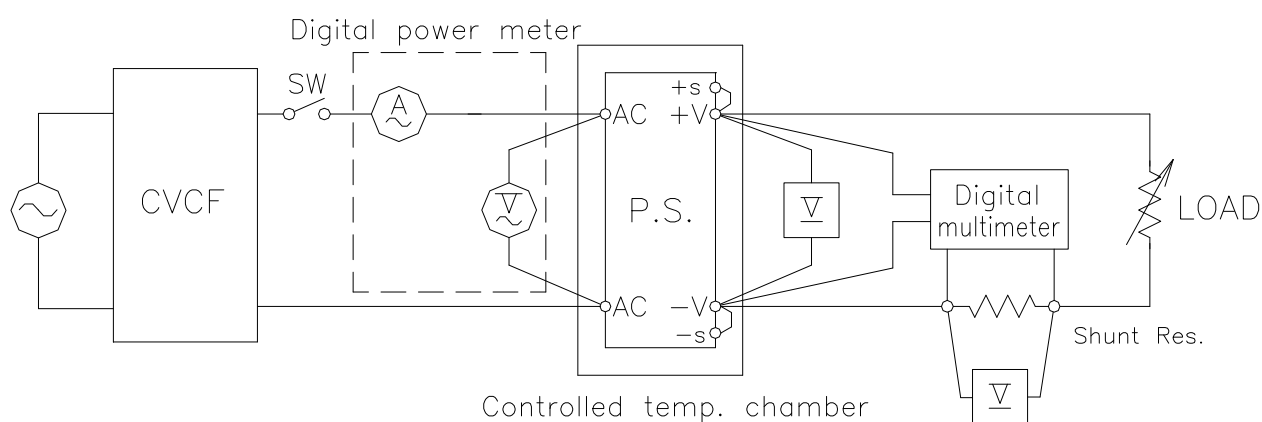
#### (1) 静特性 Steady state data



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

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

Same as Steady state data

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

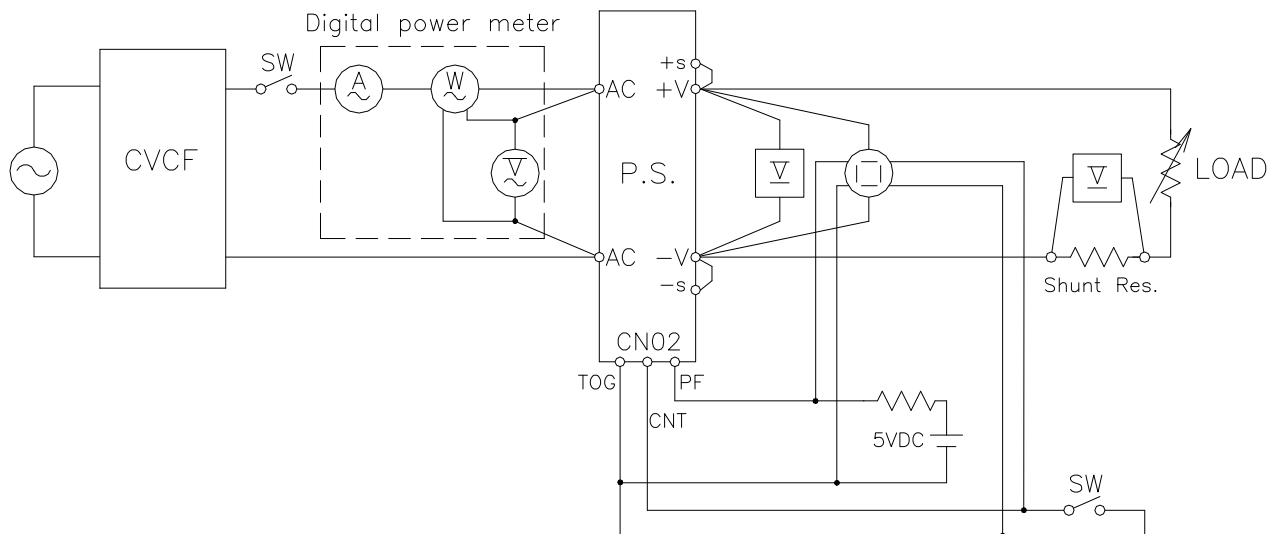
Same as Steady state data

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

Same as Steady state data

(7) ON/OFFコントロール時出力立ち上がり特性

Output rise characteristics with ON/OFF CONTROL



(8) ON/OFFコントロール時出力立ち下がり特性

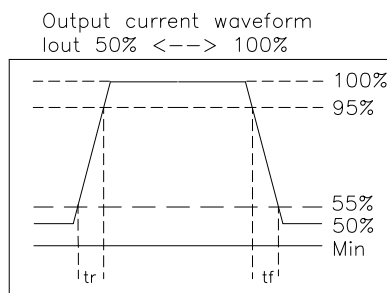
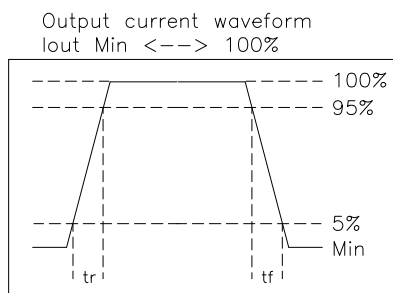
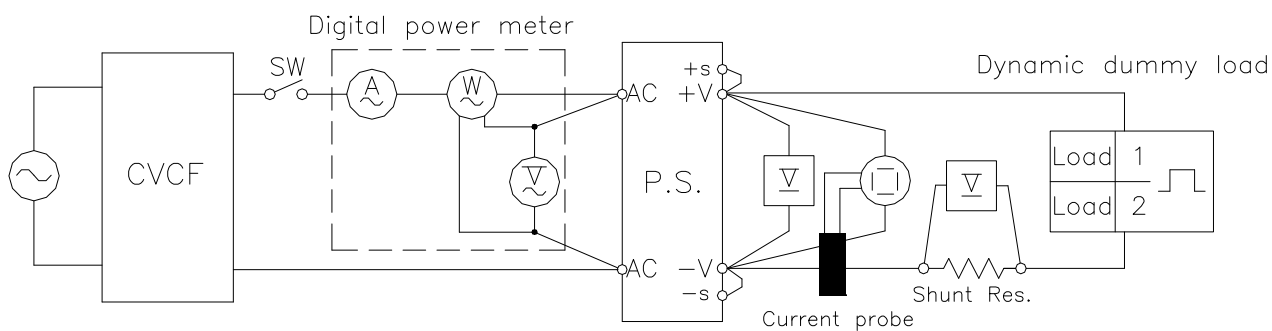
Output fall characteristics with ON/OFF CONTROL

Same as Output rise characteristics with ON/OFF CONTROL

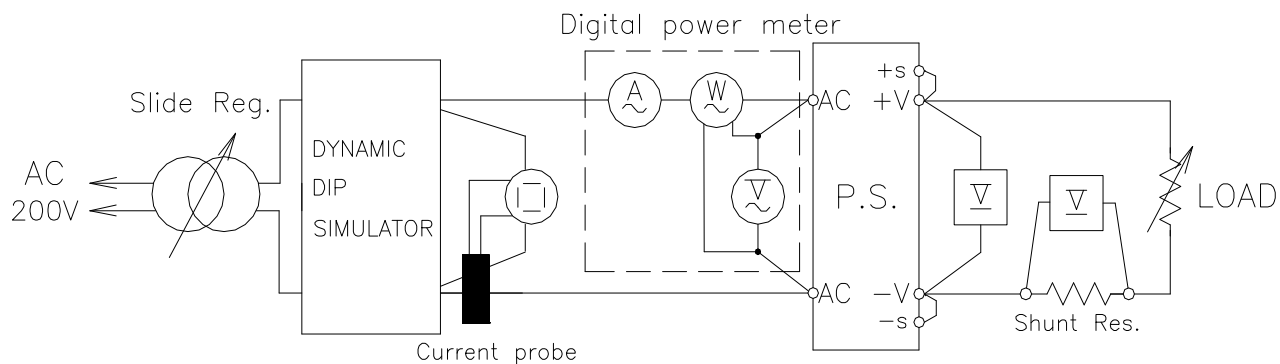
(9) 過渡応答（入力急変）特性 Dynamic line response characteristics

Same as Steady state data

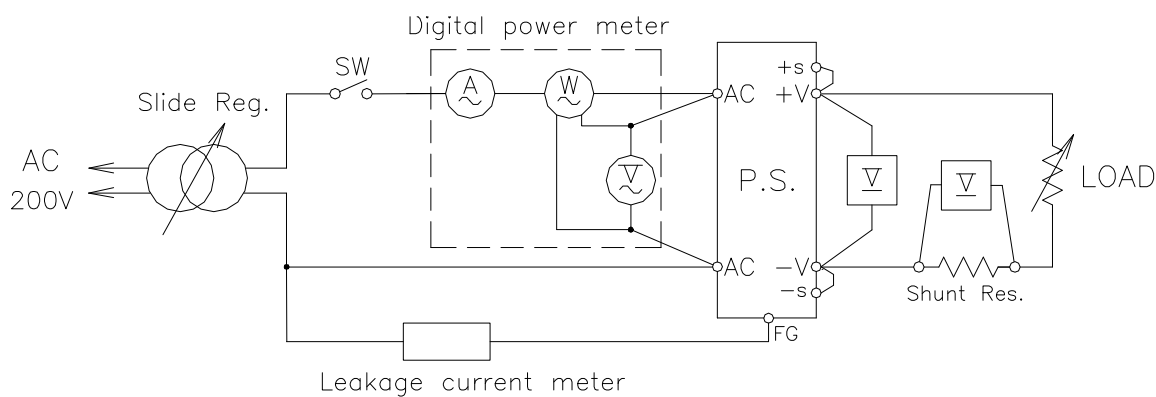
(10) 過渡応答（負荷急変）特性 Dynamic load response characteristics



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



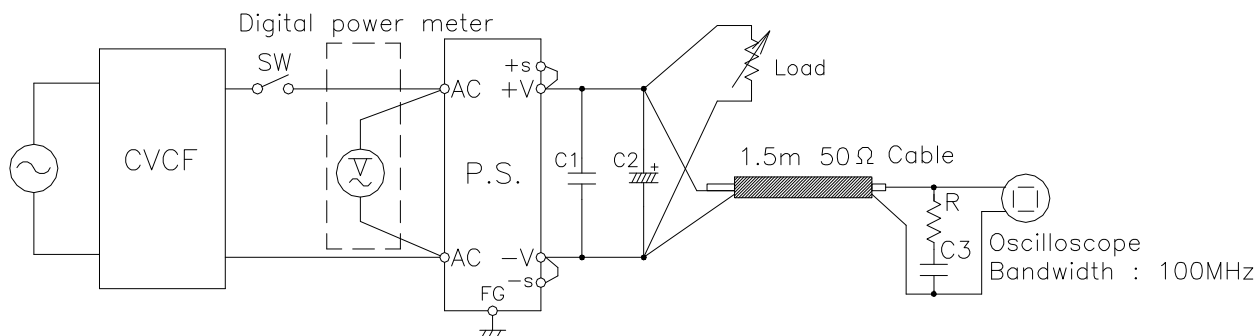
(12) リーク電流特性 Leakage current characteristics



NOTE : Leakage current measured through the 1k ohm resistor.  
Range used---AC(For HIOKI MODEL 3155)

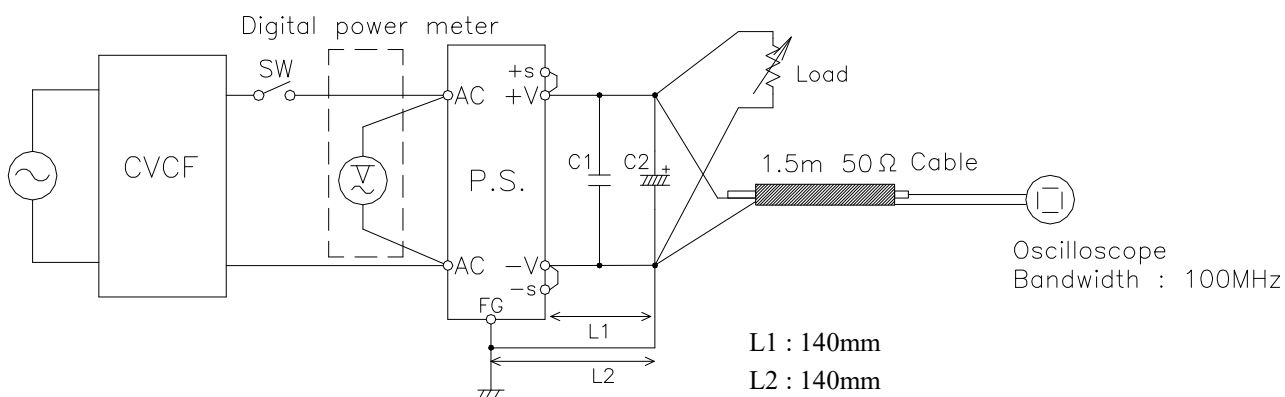
(13) 出力リップル、ノイズ特性 Output ripple and noise characteristics

(a) Normal Mode (JEITA Standard RC-9131A)



- R : 50 Ω
- C1 : 0.47uF Film capacitor
- C2 : 100uF Electrolytic capacitor
- C3 : 4700pF Film capacitor

(b) Normal + Common Mode



- L1 : 140mm
- L2 : 140mm
- C1 : 0.47uF Film capacitor
- C2 : 100uF Electrolytic capacitor

(14) スタンバイ電流 Stand-by current

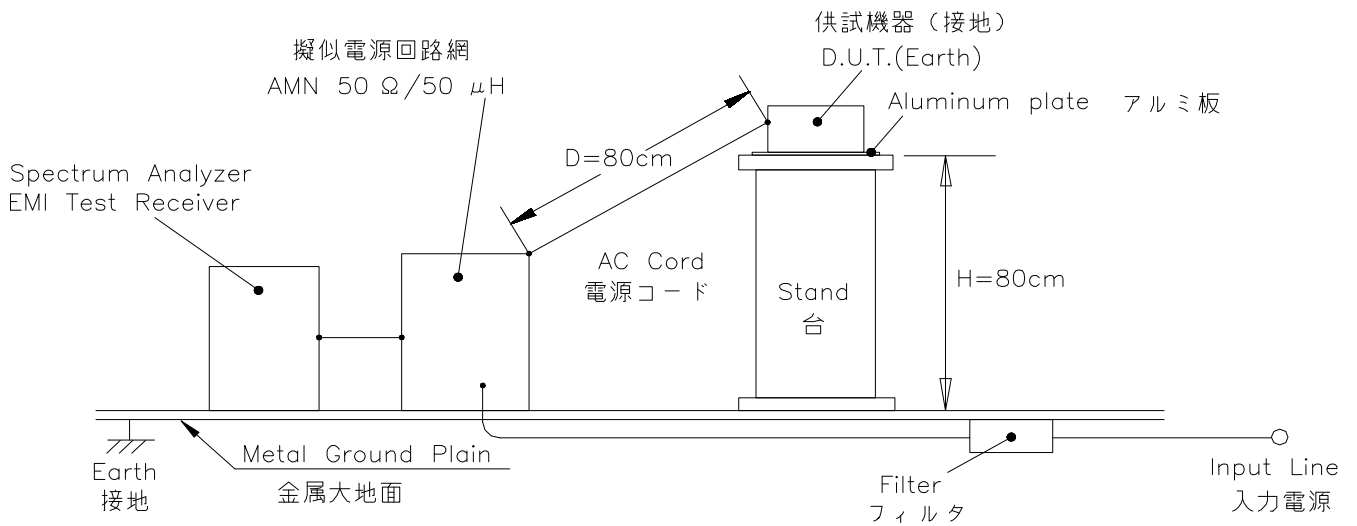
Same as Steady state data

(15) EMI 特性

Electro-Magnetic Interference characteristics

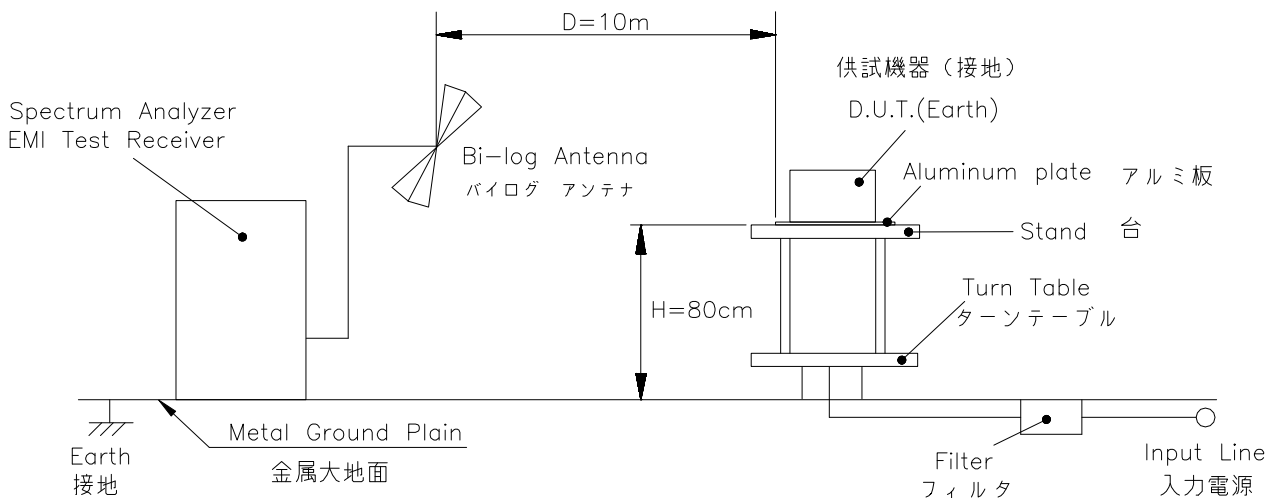
(a) 雑音端子電圧 (帰還ノイズ)

Conducted Emission Noise



(b) 雑音電界強度 (輻射ノイズ)

Radiated Emission Noise





## 1.2 使用測定機器 List of equipment used

No.	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	TEKTRONIX	TDS540C/TDS5054
2	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DL1740EL/DL7480/DL7440/DL1620
3	DIGITAL MULTIMETER	AGILENT TECHNOLOGY	34970A
4	DIGITAL POWER METER	YOKOGAWA ELECT.	WT210
5	DIGITAL POWER METER	HIOKI	3331/3332/3187
6	SHUNT RESISTOR	YOKOGAWA ELECT.	2215/2216
7	CURRENT PROBE/AMPLIFIER	TEKTRONIX	A6303/AM503B
8	CURRENT PROBE/AMPLIFIER	YOKOGAWA ELECT.	701930/700937
9	DYNAMIC DUMMY LOAD	FUJITSUDENSO	EUL-600 $\alpha$ XL+EUL-1800 $\alpha$ L SLV
10	DYNAMIC DUMMY LOAD	KIKUSUI	PLZ1004W+PLZ2004WB
11	CVCF	KIKUSUI	PCR2000L $\times$ 2/PCR4000L/PCR4000LA
12	LEAKAGE CURRENT METER	HIOKI	3155
13	DYNAMIC DIP SIMULATOR	TAKAMISAWA	PSA-210
14	CONTROLLED TEMP. CHAMBER	ESPEC	PL-4KP/PL-1K
15	SPECTRUM ANALYZER	ROHDE&SCHWARZ	FSAC
16	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESHS10
17	AMN	ROHDE&SCHWARZ	ESH2-Z5
18	SPECTRUM ANALYZER	Agilent	E4401B/E4411B
19	EMI TEST RECEIVER	Schwarzbeck	FCVU1534
20	ANTENNA(BI-LOG ANTENNA)	Schwarzbeck	VULB9168

## 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

Iout \ Vin	85VAC	100VAC	200VAC	230VAC	265VAC	line regulation	
0%	5.035V	5.036V	5.035V	5.036V	5.036V	1mV	0.020%
50%	5.028V	5.029V	5.029V	5.029V	5.029V	1mV	0.020%
80%	5.024V	5.024V	5.025V	5.025V	5.025V	1mV	0.020%
100%	—	5.021V	5.022V	5.022V	5.022V	1mV	0.020%
load	11mV	15mV	13mV	14mV	14mV		
regulation	0.220%	0.300%	0.260%	0.280%	0.280%		

## 2. Temperature drift

Conditions Vin=100VAC

Iout=100%

Ta	-10°C	+25°C	+50°C	temperature stability	
Vout	5.006V	5.021V	5.018V	15mV	0.300%

12V

## 1. Regulation - line and load

Condition Ta : 25°C

Iout \ Vin	85VAC	100VAC	200VAC	230VAC	265VAC	line regulation	
0%	12.017V	12.017V	12.017V	12.017V	12.017V	0mV	0.000%
50%	12.007V	12.007V	12.007V	12.008V	12.007V	1mV	0.008%
80%	12.000V	12.001V	12.001V	12.001V	12.001V	1mV	0.008%
100%	—	11.996V	11.996V	11.996V	11.996V	0mV	0.000%
load	17mV	21mV	21mV	21mV	21mV		
regulation	0.142%	0.175%	0.175%	0.175%	0.175%		

## 2. Temperature drift

Conditions Vin=100VAC

Iout=100%

Ta	-10°C	+25°C	+50°C	temperature stability	
Vout	11.972V	11.996V	12.005V	33mV	0.275%

## 2.1 静特性 Steady state data

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

24V

### 1. Regulation - line and load

Condition Ta : 25°C

Iout \ Vin	85VAC	100VAC	200VAC	230VAC	265VAC	line regulation	
0%	23.989V	23.987V	23.989V	23.987V	23.987V	2mV	0.008%
50%	23.986V	23.986V	23.986V	23.986V	23.985V	1mV	0.004%
80%	23.984V	23.983V	23.984V	23.983V	23.983V	1mV	0.004%
100%	—	23.981V	23.981V	23.981V	23.981V	0mV	0.000%
load	5mV	6mV	8mV	6mV	6mV		
regulation	0.021%	0.025%	0.033%	0.025%	0.025%		

### 2. Temperature drift

Conditions Vin=100VAC

Iout=100%

Ta	-10°C	+25°C	+50°C	temperature stability	
Vout	24.071V	23.981V	23.975V	96mV	0.400%

60V

### 1. Regulation - line and load

Condition Ta : 25°C

Iout \ Vin	85VAC	100VAC	200VAC	230VAC	265VAC	line regulation	
0%	60.012V	60.012V	60.018V	60.020V	60.012V	8mV	0.013%
50%	60.015V	60.012V	60.012V	60.014V	60.014V	3mV	0.005%
80%	60.014V	60.012V	60.012V	60.013V	60.013V	2mV	0.003%
100%	—	60.011V	60.012V	60.012V	60.013V	2mV	0.003%
load	3mV	1mV	6mV	8mV	2mV		
regulation	0.005%	0.002%	0.010%	0.013%	0.003%		

### 2. Temperature drift

Conditions Vin=100VAC

Iout=100%

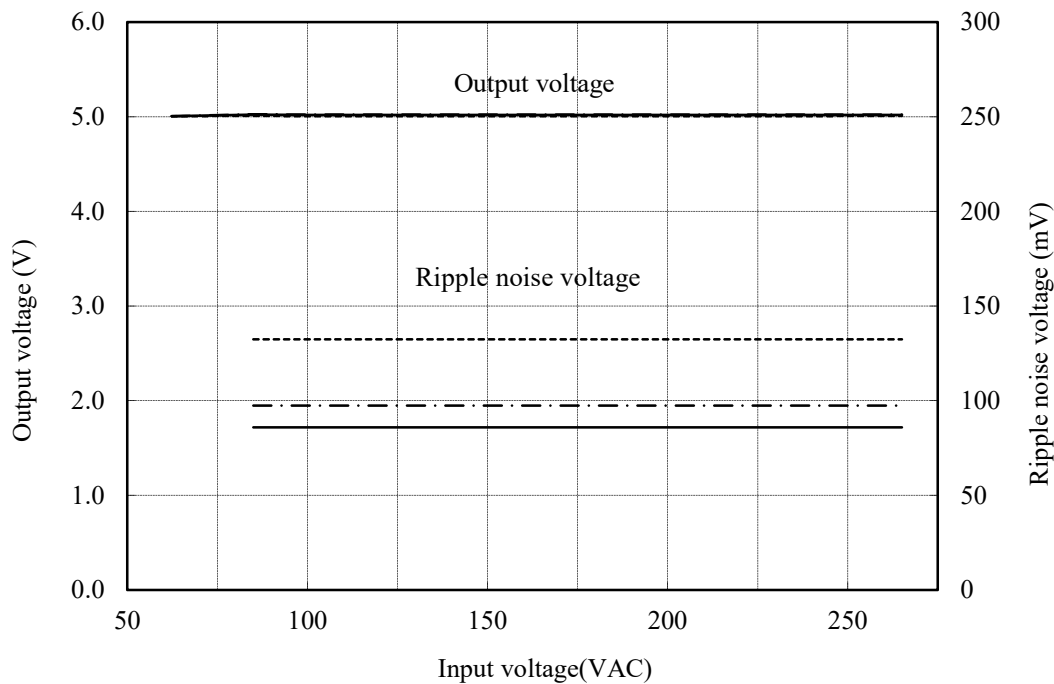
Ta	-10°C	+25°C	+50°C	temperature stability	
Vout	60.020V	60.011V	59.918V	102mV	0.170%

(2) 出力電圧・リップルノイズ電圧対入力電圧

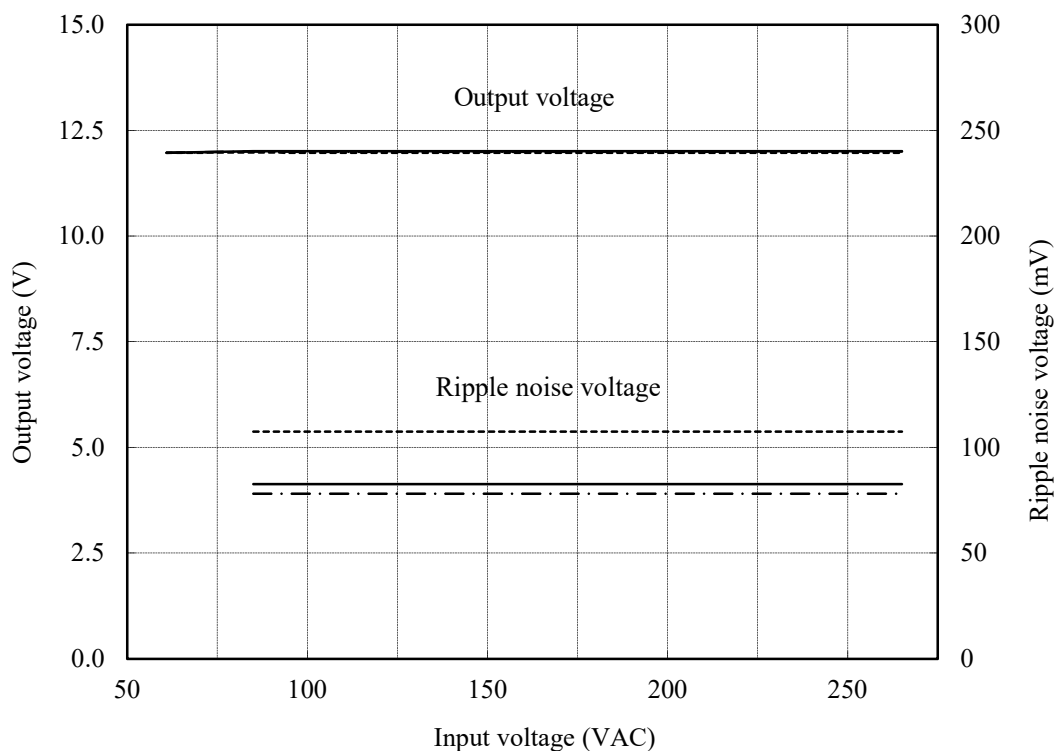
Output voltage and Ripple noise voltage vs. Input voltage

Conditions Iout : 100 %  
 Ta : -10 °C .....  
 25 °C - · - · -  
 50 °C \_\_\_\_\_  
 (40°C at 5V)

**5V**



**12V**

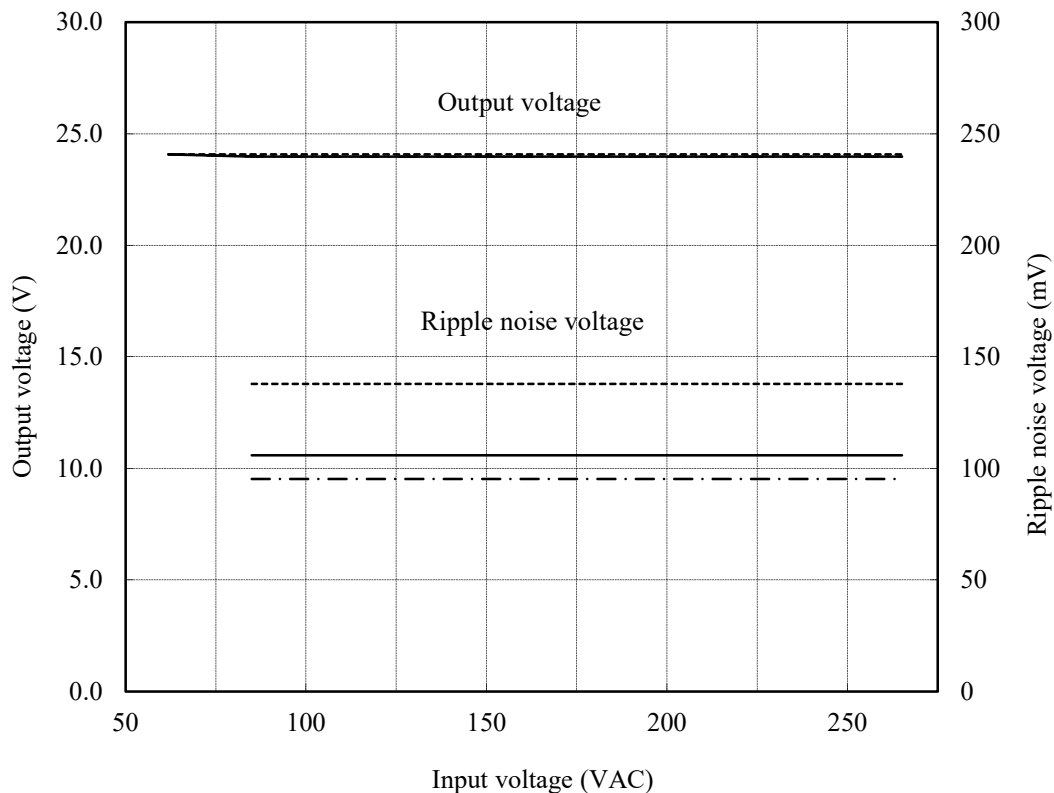


(2) 出力電圧・リップルノイズ電圧対入力電圧

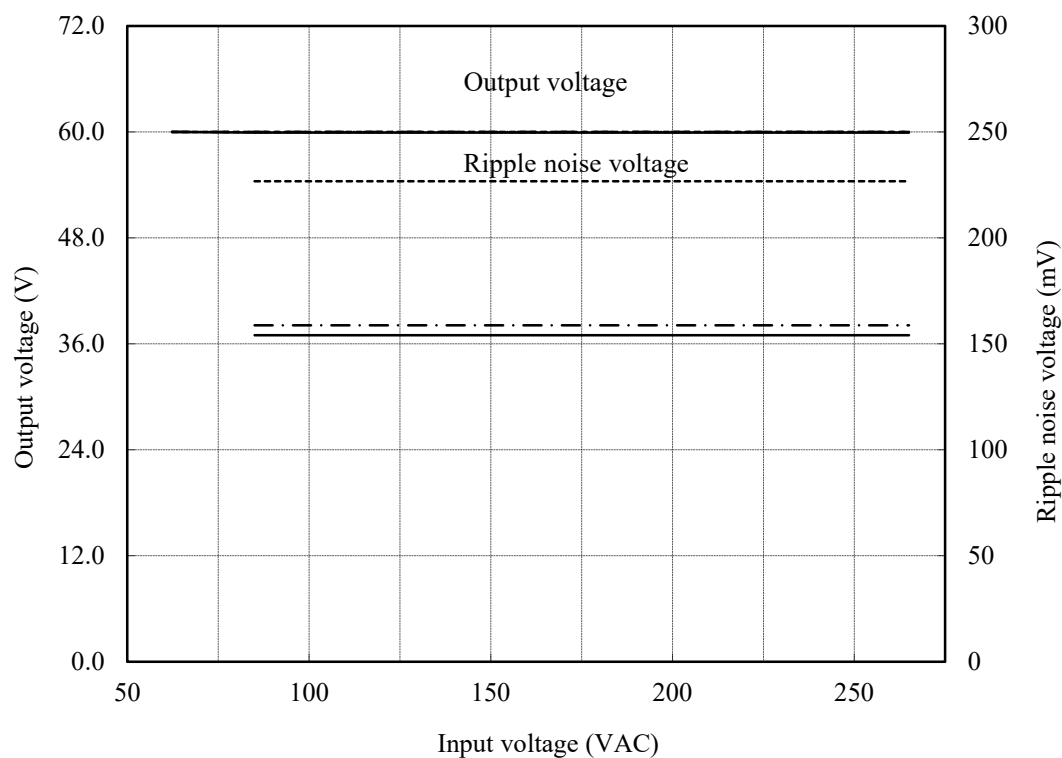
Output voltage and Ripple noise voltage vs. Input voltage

Conditions Iout : 100 %  
 Ta : -10 °C .....  
 25 °C - · - · -  
 50 °C ———

**24V**



**60V**

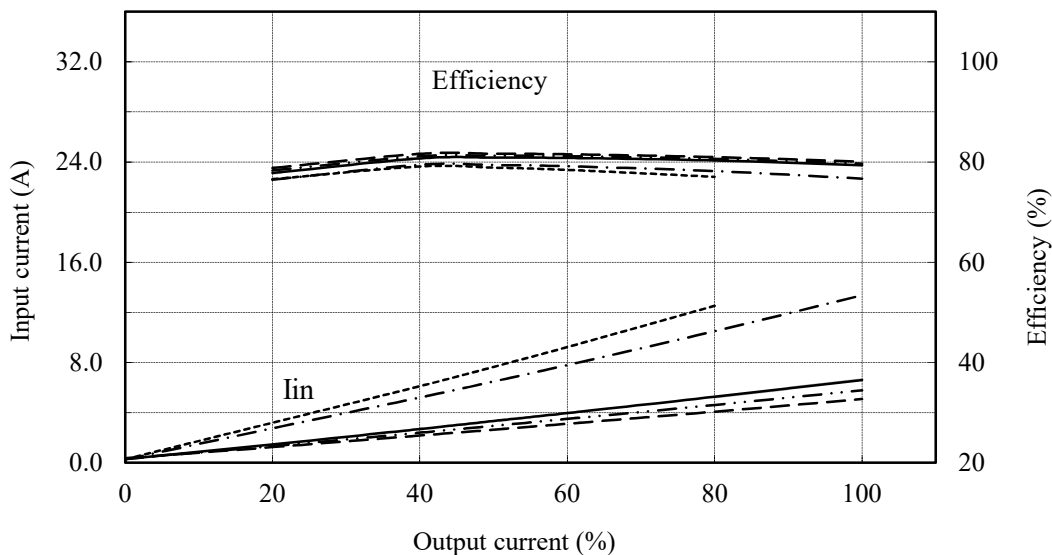


## (3) 効率・入力電流対出力電流

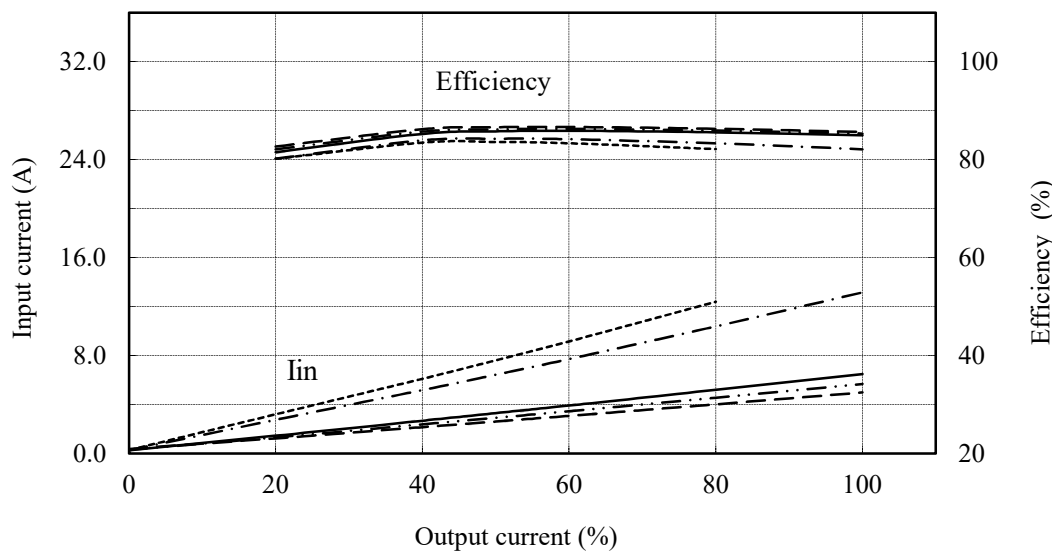
Efficiency and Input current vs. Output current

Conditions  $V_{in}$  : 85 VAC - · - · - ·  
 : 100 VAC - · - · -  
 : 200 VAC ———  
 : 230 VAC - · - · -  
 : 265 VAC - - - - -  
 $T_a$  : 25 °C

5V



12V

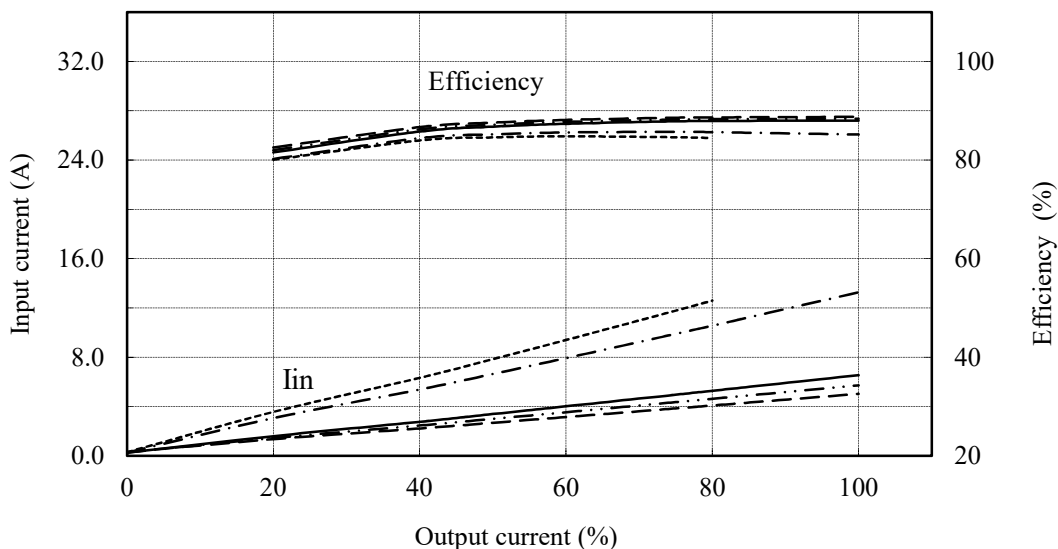


## (3) 効率・入力電流対出力電流

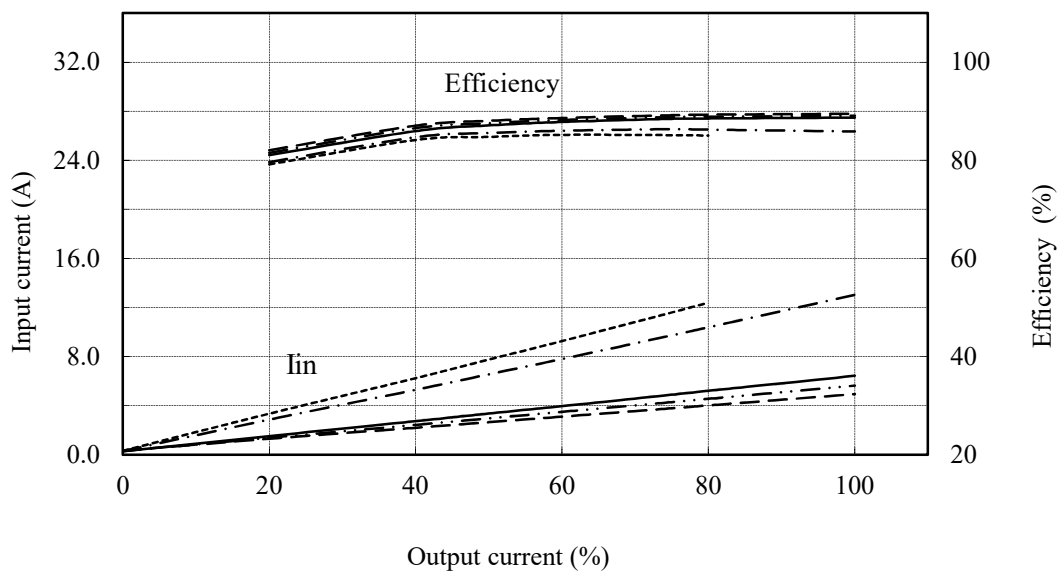
Efficiency and Input current vs. Output current

Conditions Vin : 85 VAC - - - - -  
 : 100 VAC - · - · -  
 : 200 VAC ———  
 : 230 VAC - · · · -  
 : 265 VAC - - - - -  
 Ta : 25 °C

24V



60V

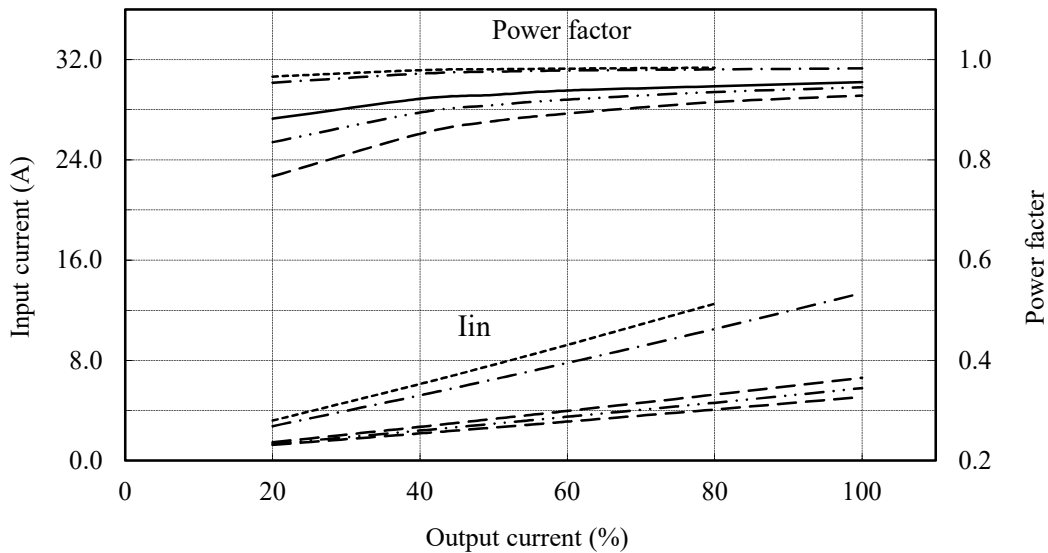


(4) 力率・入力電流対出力電流

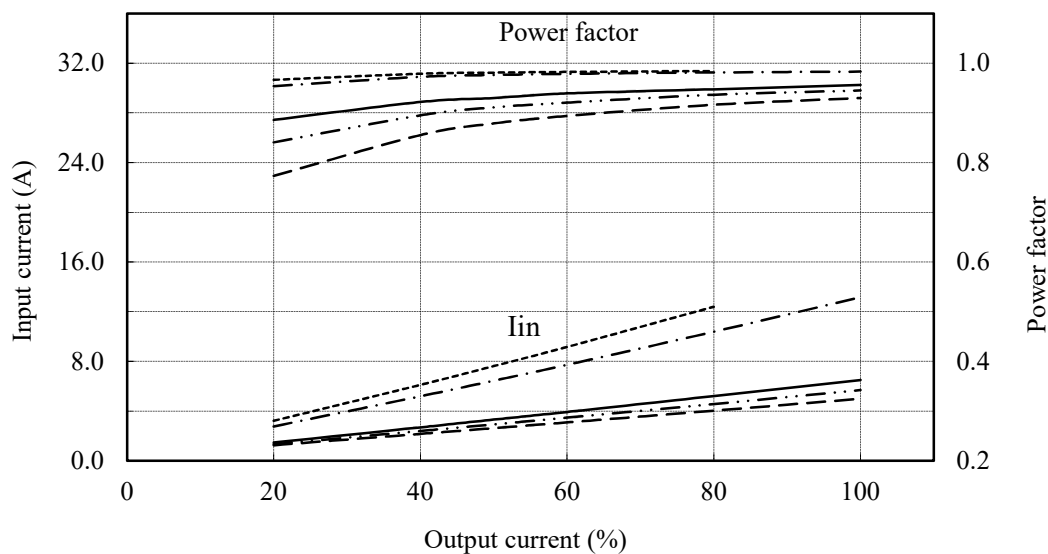
Power factor and Input current vs. Output current

Conditions Vin : 85 VAC .....  
 : 100 VAC -.-.-.-  
 : 200 VAC ————  
 : 230 VAC -·-·-·-  
 : 265 VAC - - - -  
 Ta : 25 °C

5V



12V



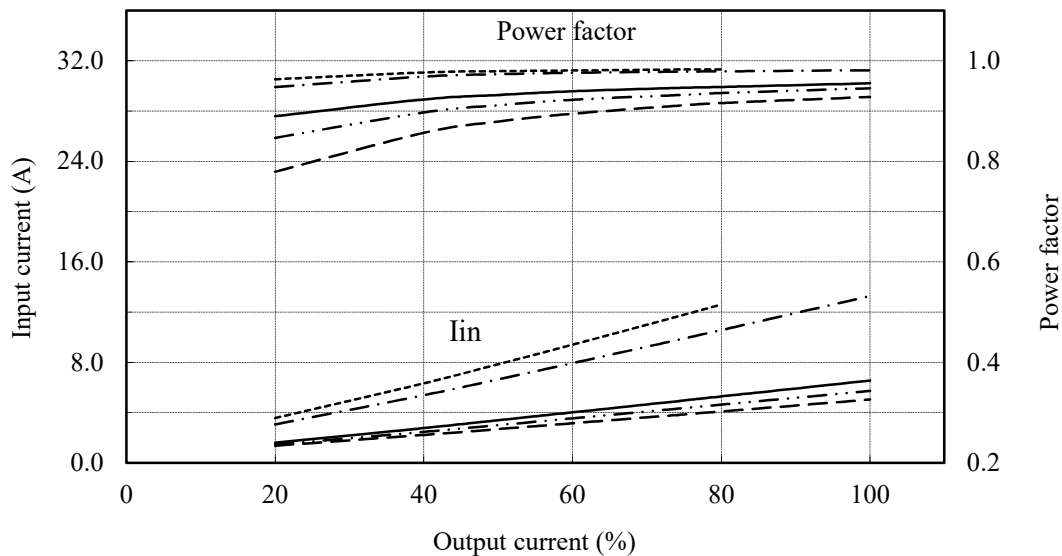


(4) 力率・入力電流対出力電流

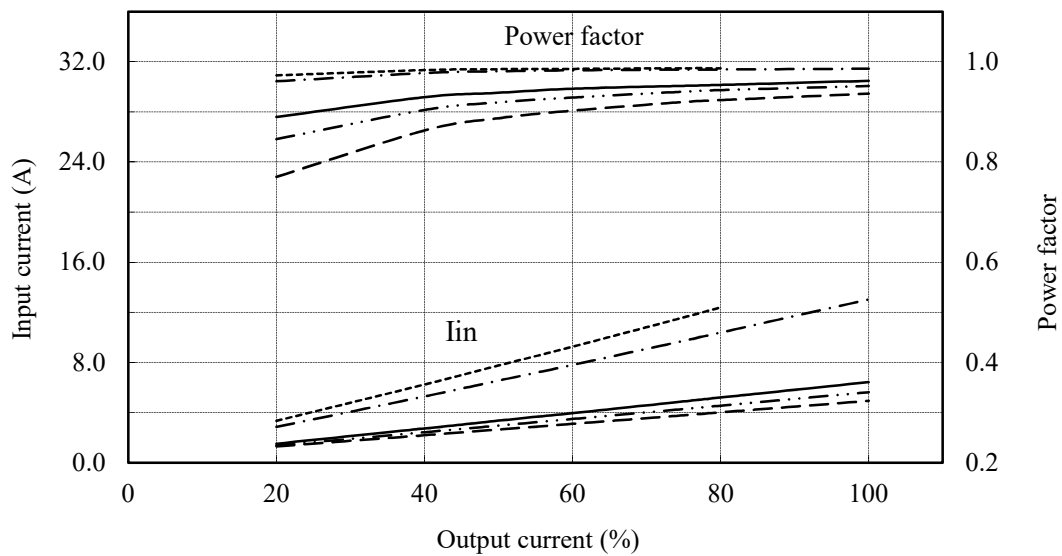
Power factor and Input current vs. Output current

Conditions  $V_{in}$  : 85 VAC .....  
 : 100 VAC -.-.-.-  
 : 200 VAC ————  
 : 230 VAC -·-·-·-  
 : 265 VAC - - - -  
 $T_a$  : 25 °C

24V



60V



## 2.2 通電ドリフト特性

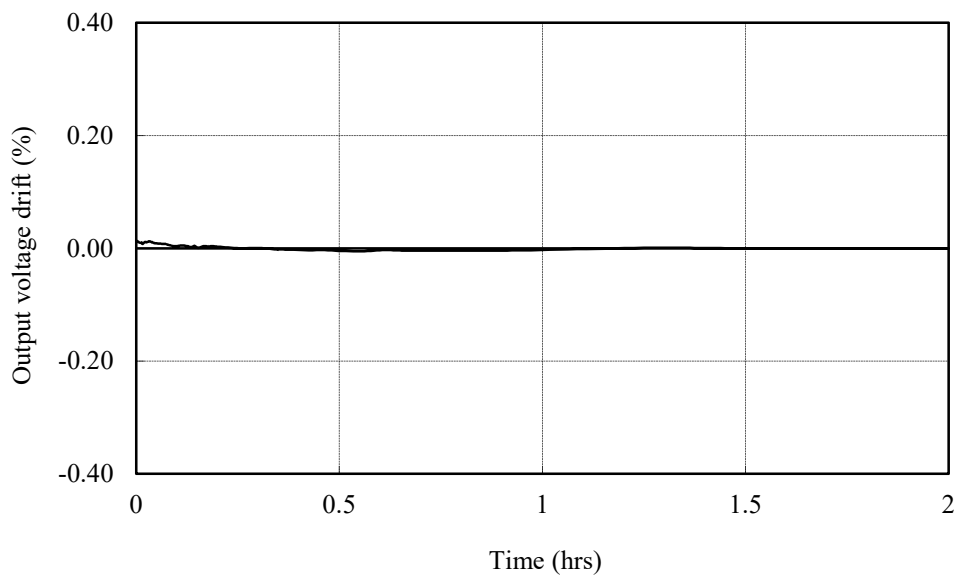
Warm up voltage drift characteristics

Conditions  $V_{in}$  : 100 VAC

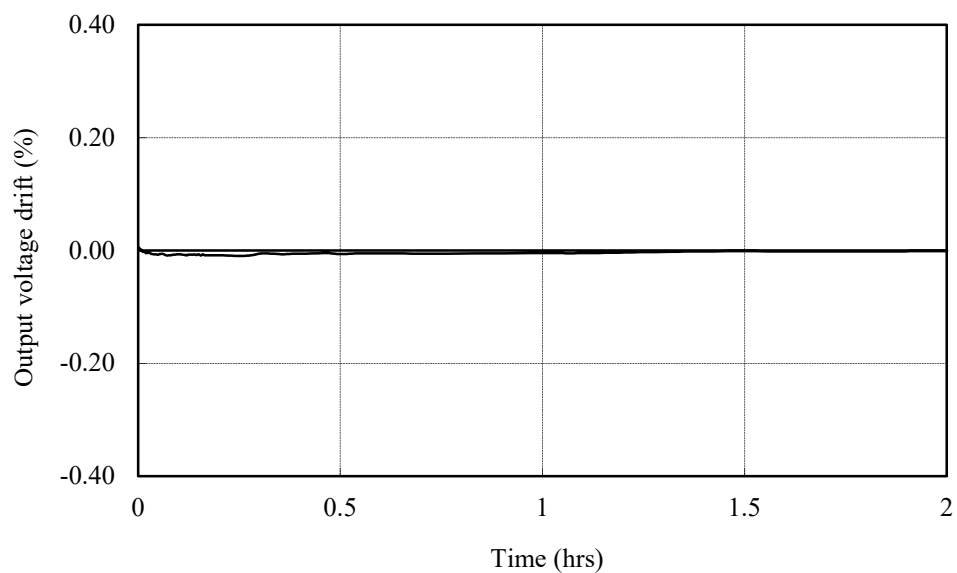
$I_{out}$  : 100 %

$T_a$  : 25 °C

5V



12V



## 2.2 通電ドリフト特性

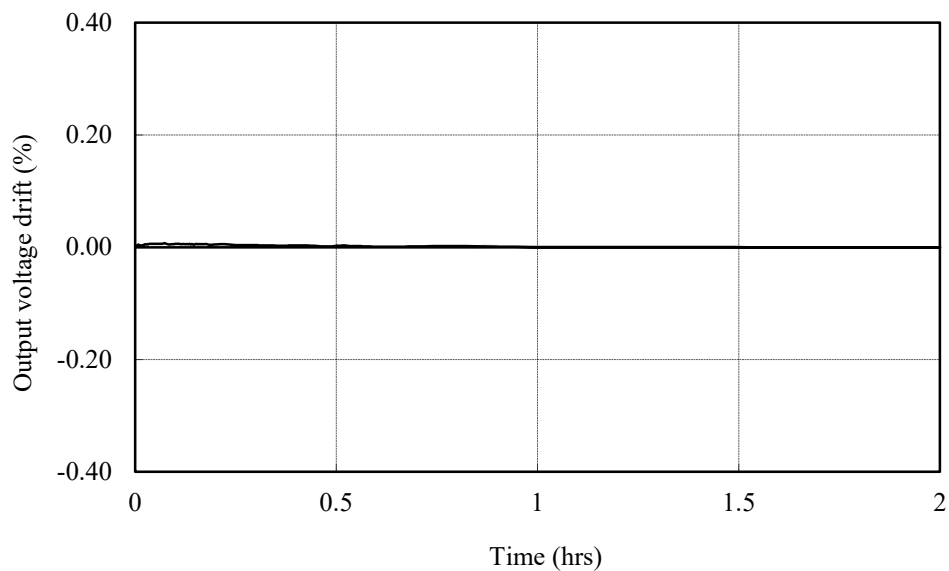
Warm up voltage drift characteristics

Conditions  $V_{in}$  : 100 VAC

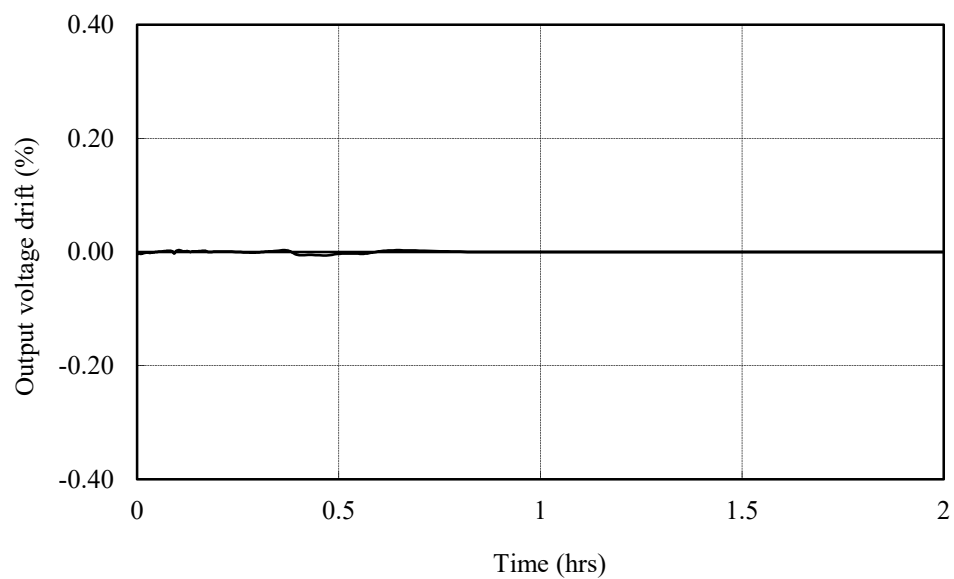
$I_{out}$  : 100 %

$T_a$  : 25 °C

24V



60V

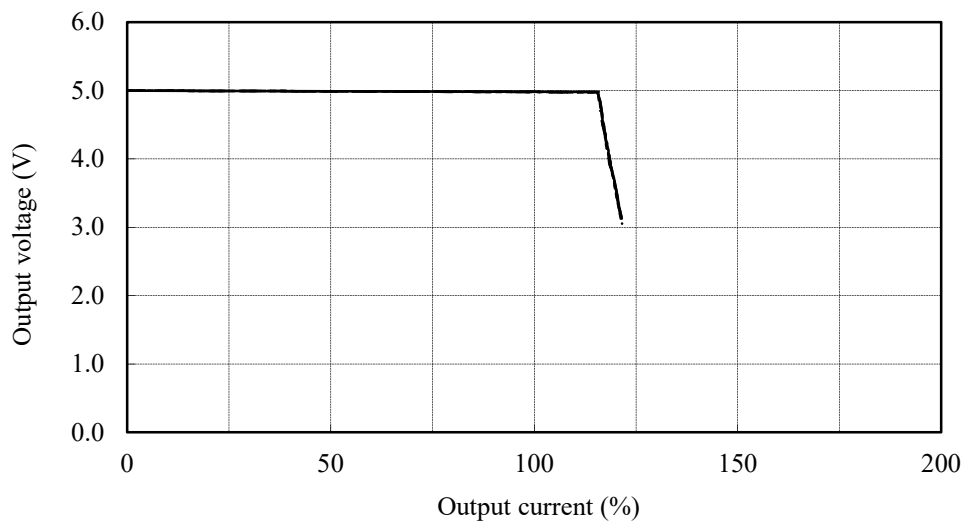


## 2.3 過電流保護特性

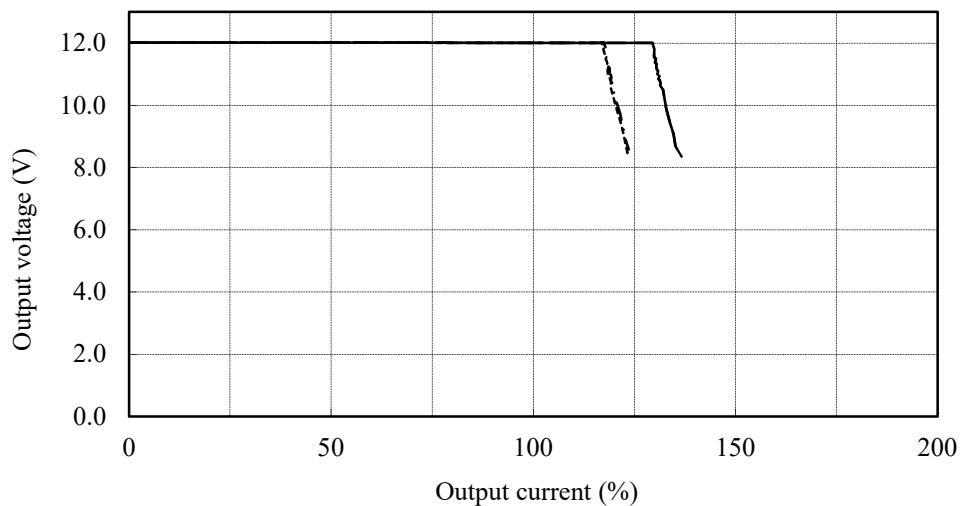
Over current protection (OCP) characteristics

Conditions Vin : 85 VAC .....  
 100 VAC -.-.-.  
 200 VAC ———  
 265 VAC - - - -  
 Ta : 25 °C

**5V**



**12V**

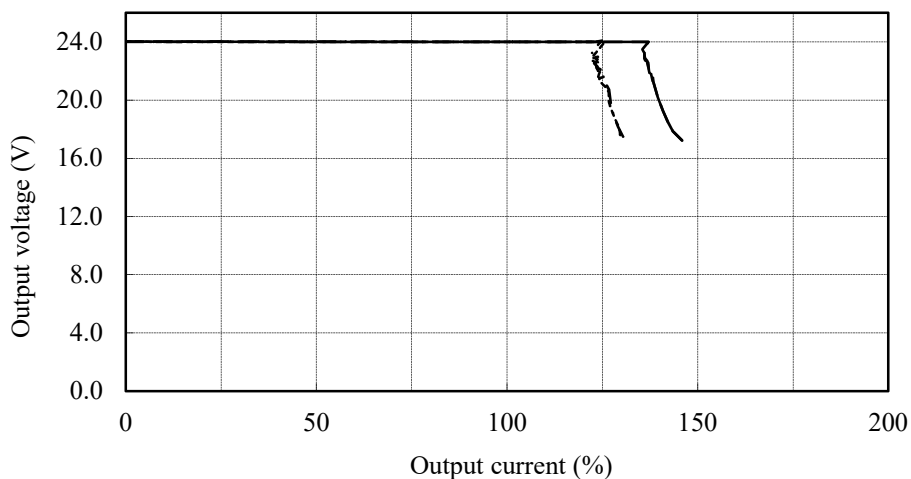


## 2.3 過電流保護特性

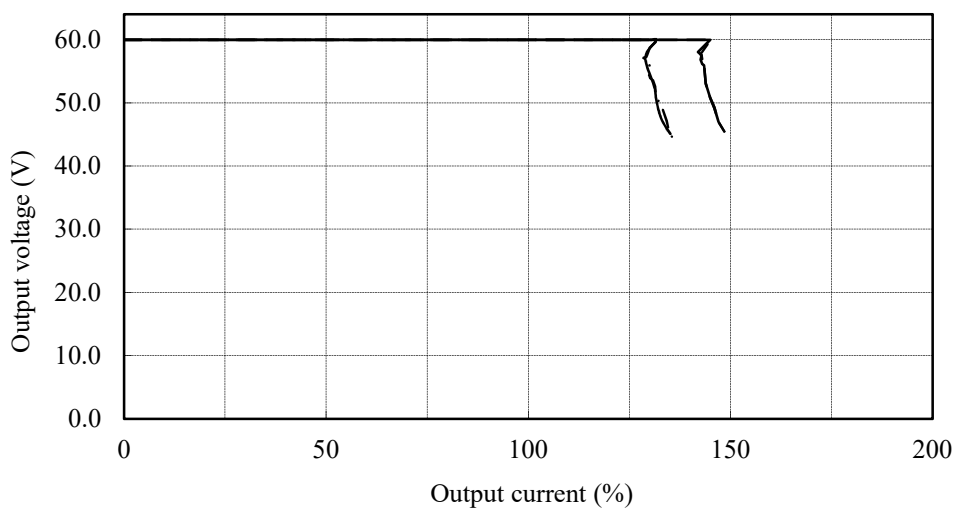
Over current protection (OCP) characteristics

Conditions Vin : 85 VAC .....  
 100 VAC -.-.-.-  
 200 VAC ————  
 265 VAC - - - -  
 Ta : 25 °C

24V



60V



## 2.3 過電流保護特性

Over current protection (OCP) characteristics

Conditions  $V_{in}$  : 100VAC

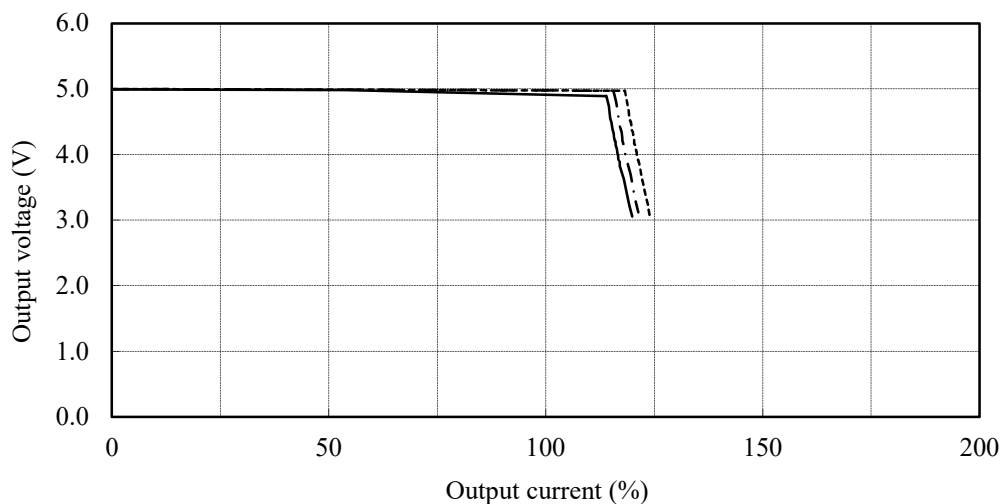
$T_a$  : -10 °C    - · - · - ·

25 °C    - · - - - ·

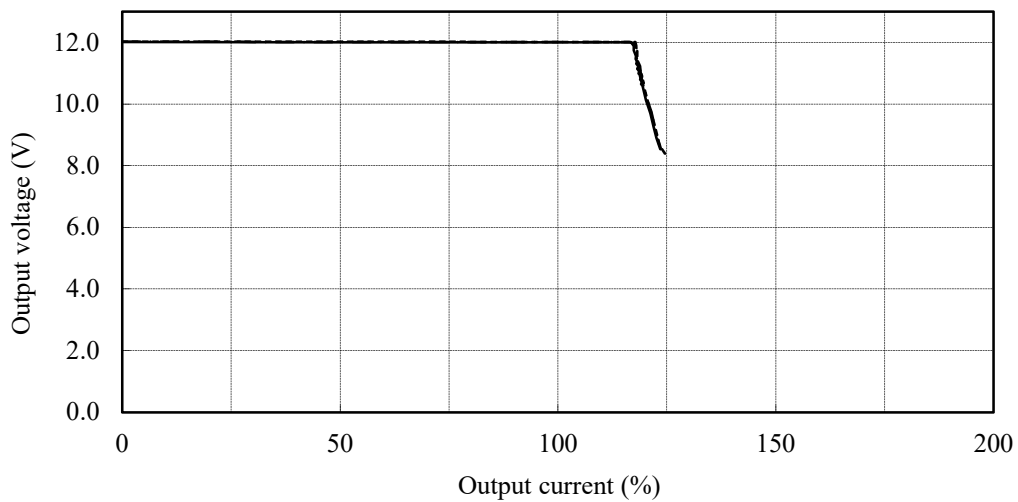
50 °C    ———

(40°C at 5V)

**5V**



**12V**



## 2.3 過電流保護特性

Over current protection (OCP) characteristics

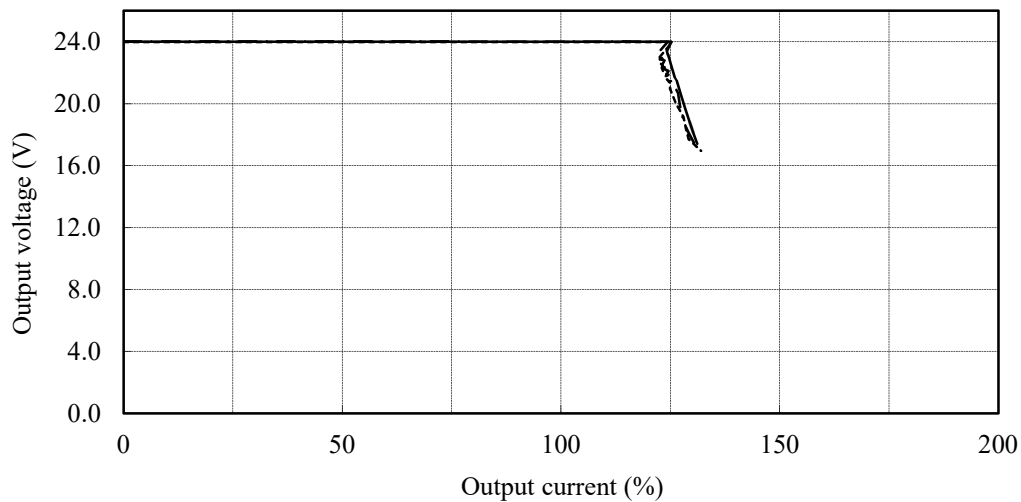
Conditions  $V_{in}$  : 100VAC

$T_a$  : -10 °C    - - - - -

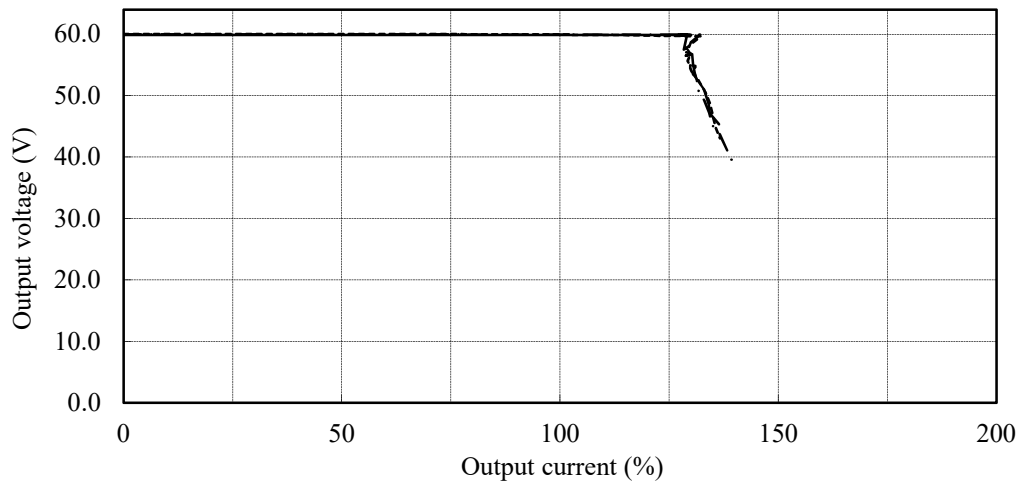
25 °C    - · - · -

50 °C    ———

24V



60V



2.4 過電圧保護特性

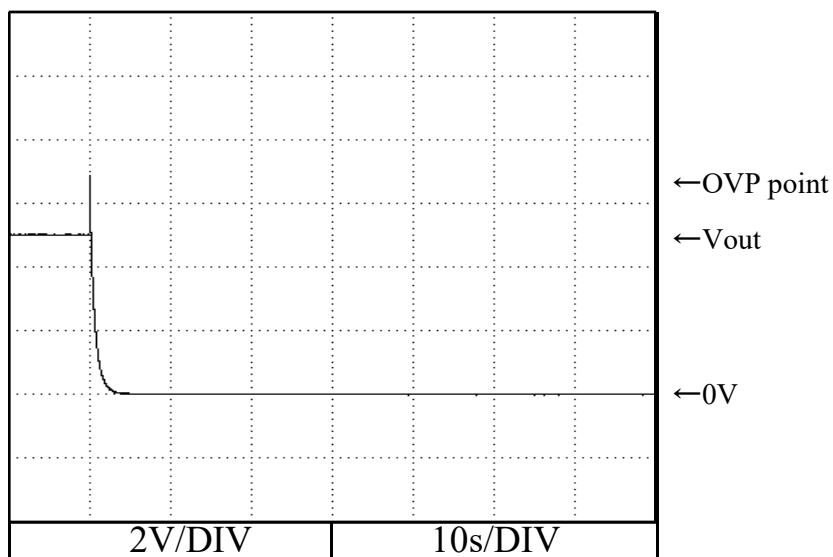
Over voltage protection (OVP) characteristics

Conditions Vin : 100 VAC

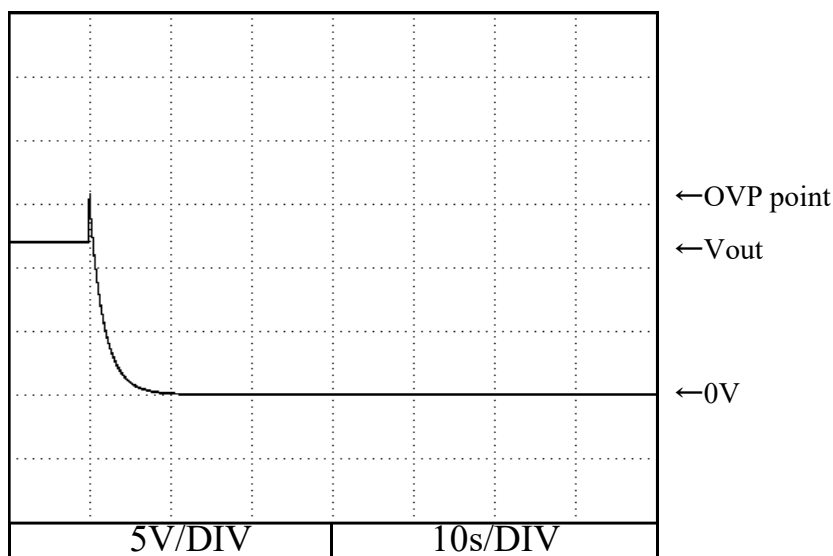
Iout : 0 %

Ta : 25 °C

5V



12V





2.4 過電圧保護特性

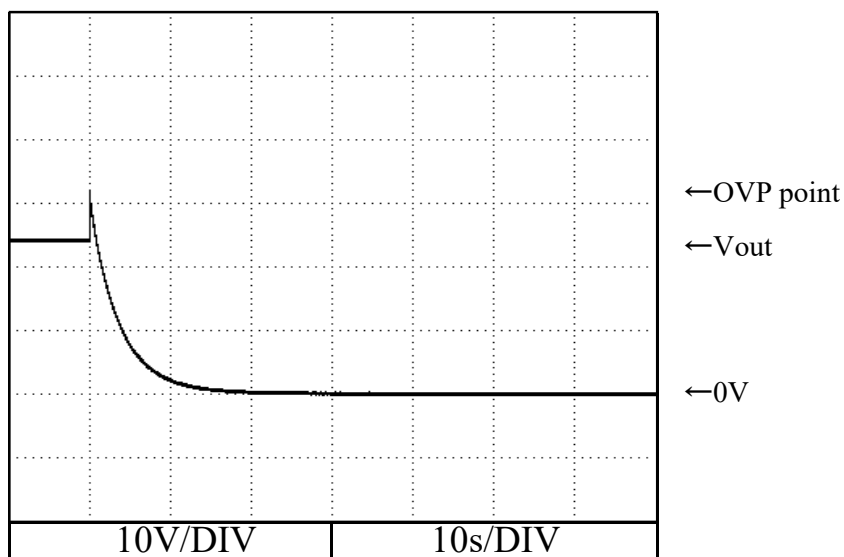
Over voltage protection (OVP) characteristics

Conditions Vin : 100 VAC

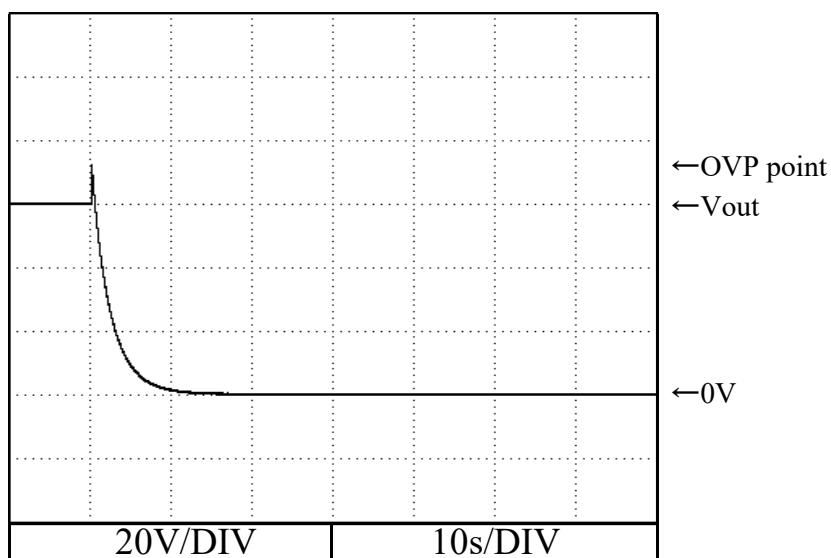
Iout : 0 %

Ta : 25 °C

24V



60V

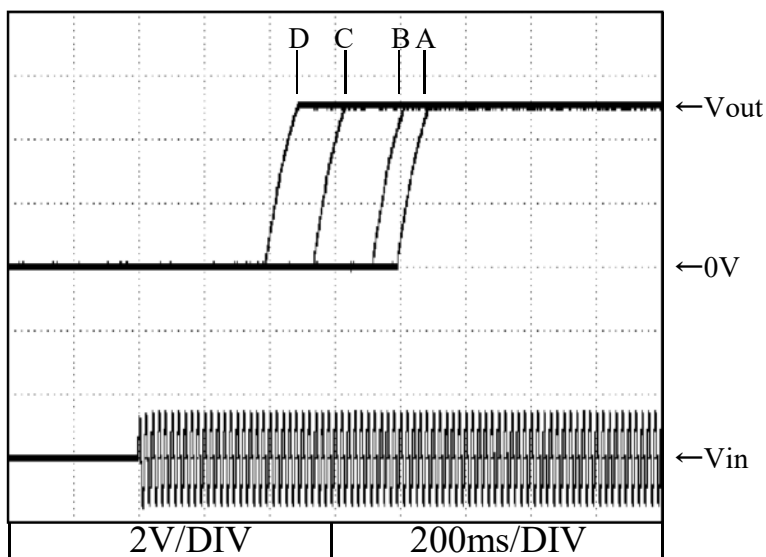


2.5 出力立ち上がり特性

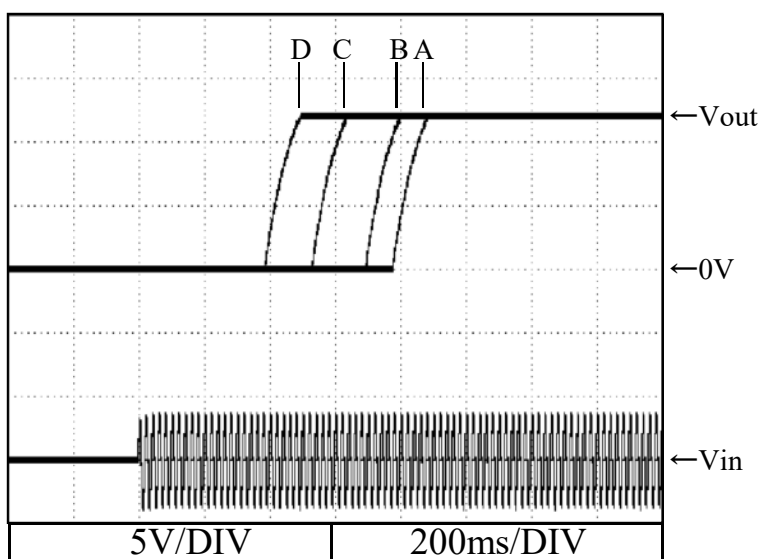
Output rise characteristics

Conditions Vin : 85 VAC (A)  
 100 VAC (B)  
 200 VAC (C)  
 265 VAC (D)  
 Iout : 0 %  
 Ta : 25 °C

5V



12V

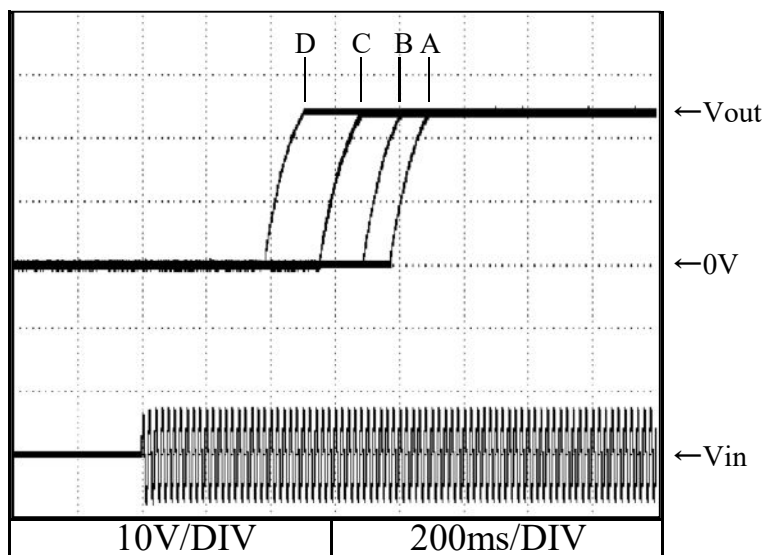


## 2.5 出力立ち上がり特性

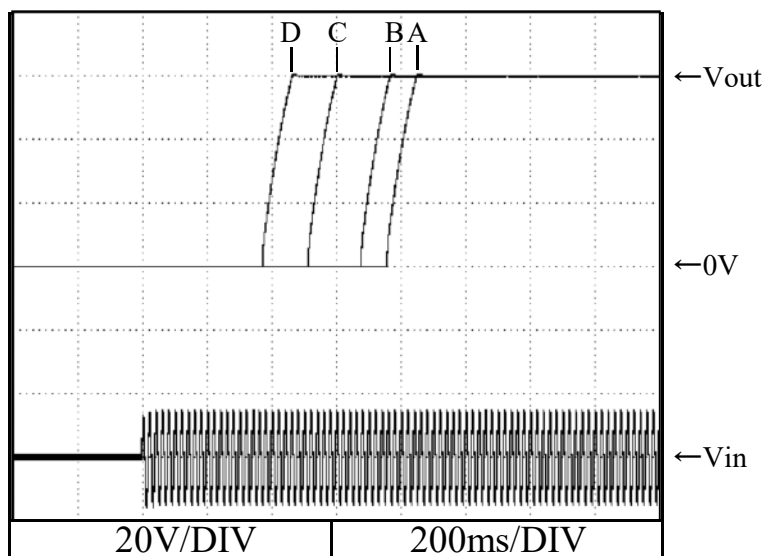
Output rise characteristics

Conditions Vin : 85 VAC (A)  
 100 VAC (B)  
 200 VAC (C)  
 265 VAC (D)  
 Iout : 0 %  
 Ta : 25 °C

24V



60V

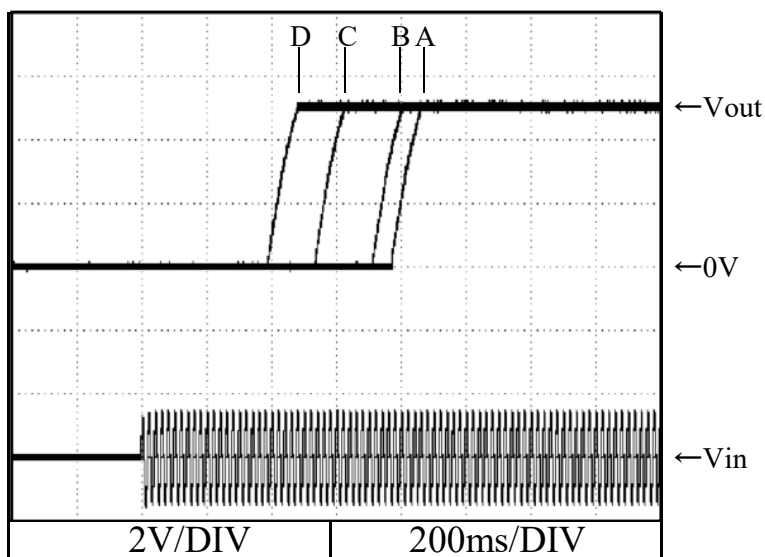


## 2.5 出力立ち上がり特性

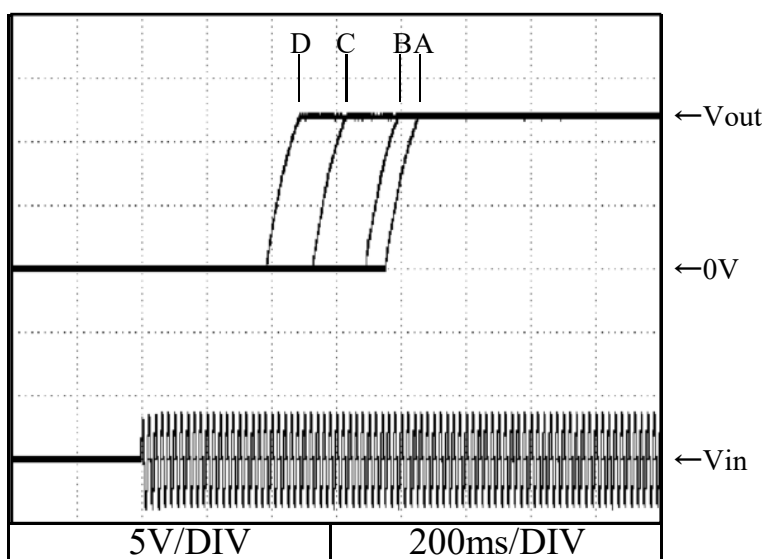
Output rise characteristics

Conditions Vin : 85 VAC (A)  
 100 VAC (B)  
 200 VAC (C)  
 265 VAC (D)  
 Iout : 100 %  
 Ta : 25 °C

5V



12V

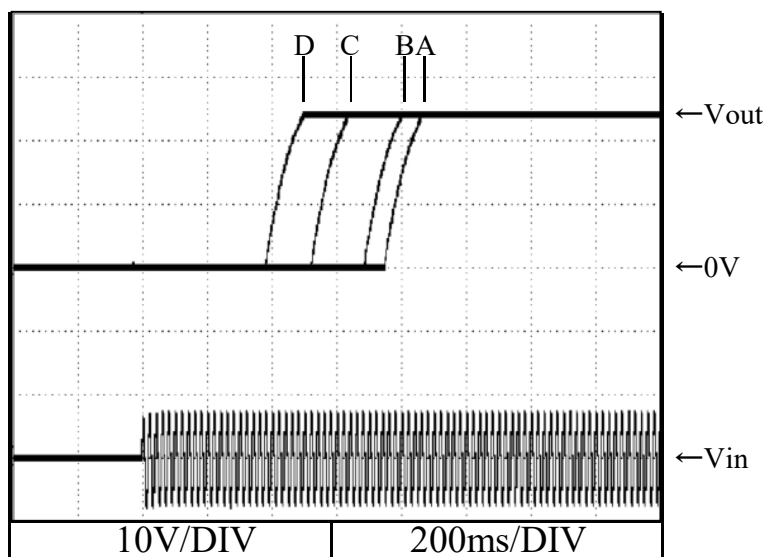


## 2.5 出力立ち上がり特性

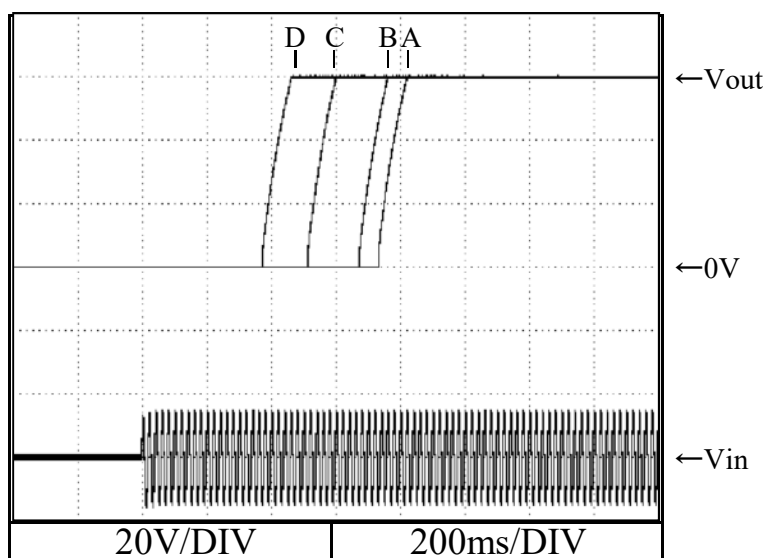
Output rise characteristics

Conditions Vin : 85 VAC (A)  
 100 VAC (B)  
 200 VAC (C)  
 265 VAC (D)  
 Iout : 100 %  
 Ta : 25 °C

24V



60V

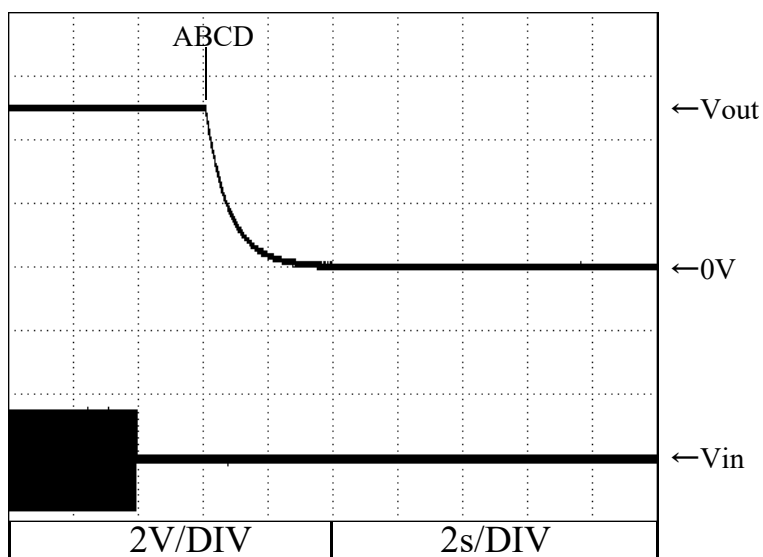


2.6 出力立ち下がり特性

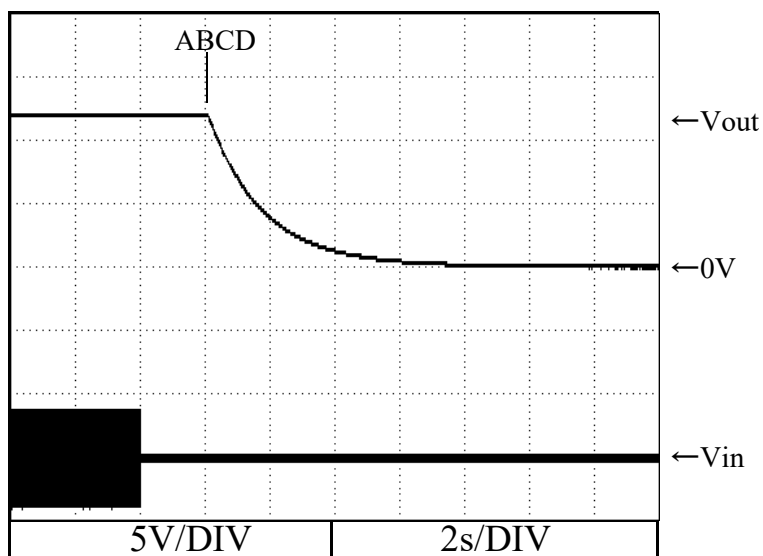
Output fall characteristics

Conditions Vin : 85 VAC (A)  
 100 VAC (B)  
 200 VAC (C)  
 265 VAC (D)  
 Iout : 0 %  
 Ta : 25 °C

5V



12V

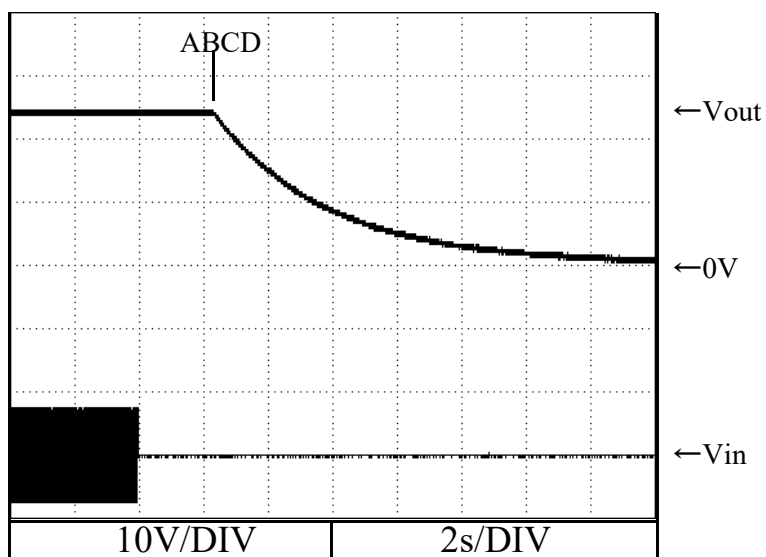


2.6 出力立ち下がり特性

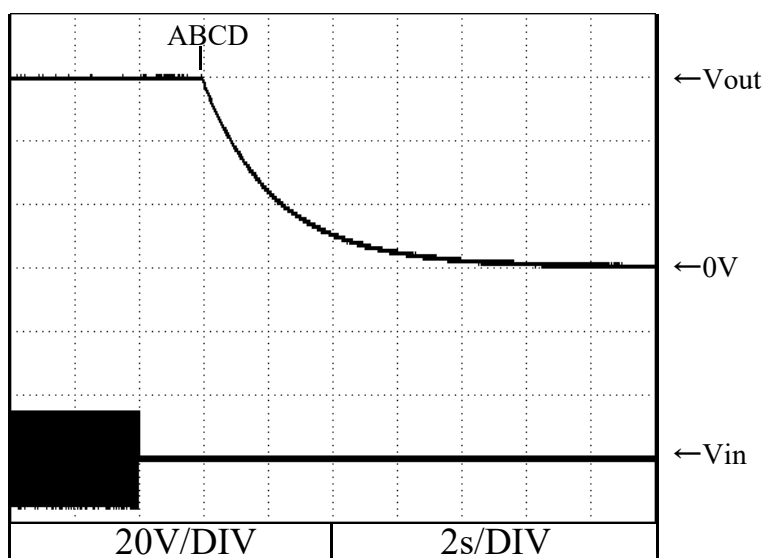
Output fall characteristics

Conditions Vin : 85 VAC (A)  
 100 VAC (B)  
 200 VAC (C)  
 265 VAC (D)  
 Iout : 0 %  
 Ta : 25 °C

24V



60V

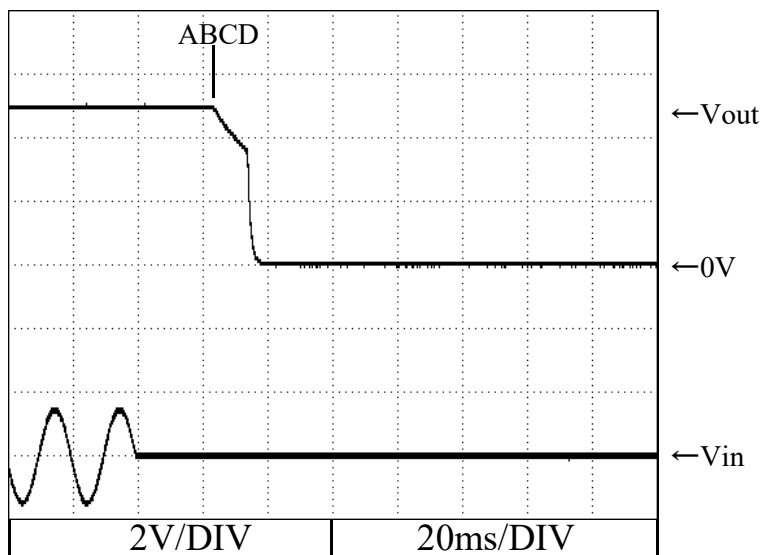


2.6 出力立ち下がり特性

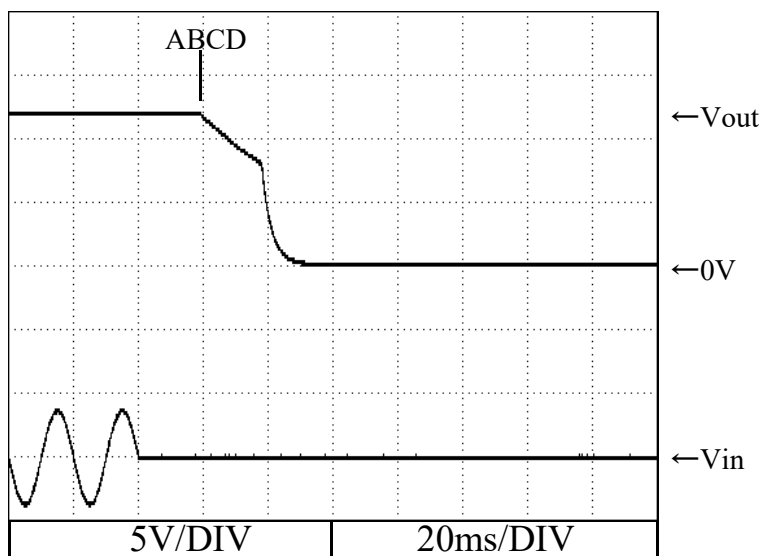
Output fall characteristics

Conditions Vin : 85 VAC (A)  
 100 VAC (B)  
 200 VAC (C)  
 265 VAC (D)  
 Iout : 100 %  
 Ta : 25 °C

5V



12V



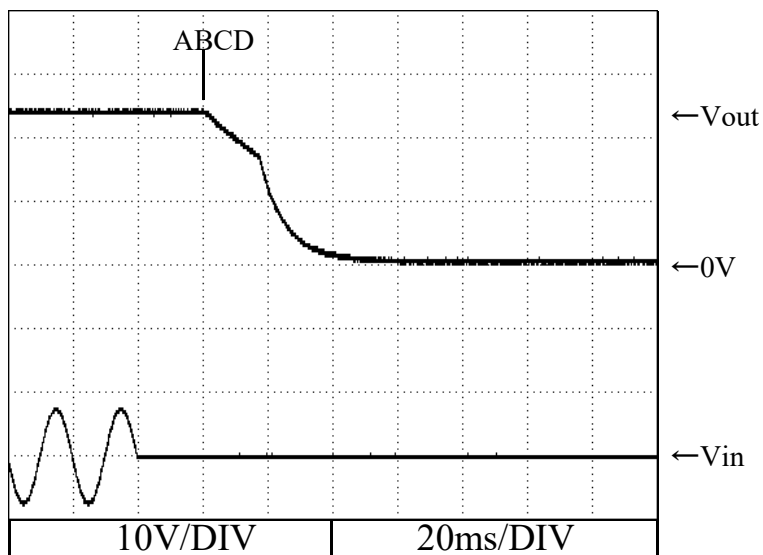


## 2.6 出力立ち下がり特性

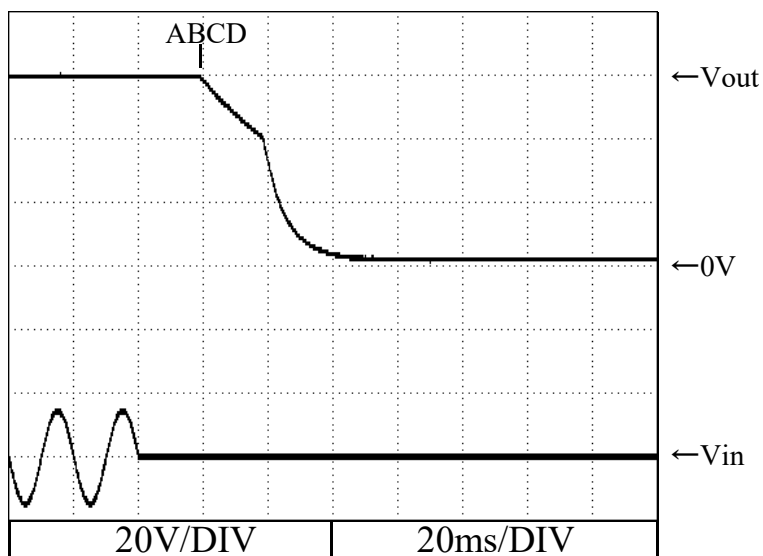
Output fall characteristics

Conditions Vin : 85 VAC (A)  
 100 VAC (B)  
 200 VAC (C)  
 265 VAC (D)  
 Iout : 100 %  
 Ta : 25 °C

24V



60V



## 2.7 ON/OFF コントロール時出力立ち上がり特性

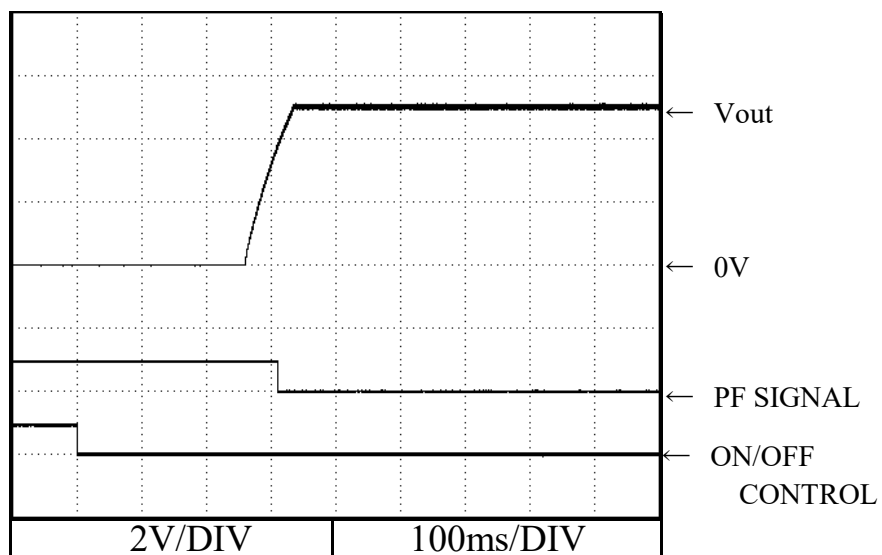
Output rise characteristics with ON/OFF CONTROL

Conditions  $V_{in}$  : 100 VAC

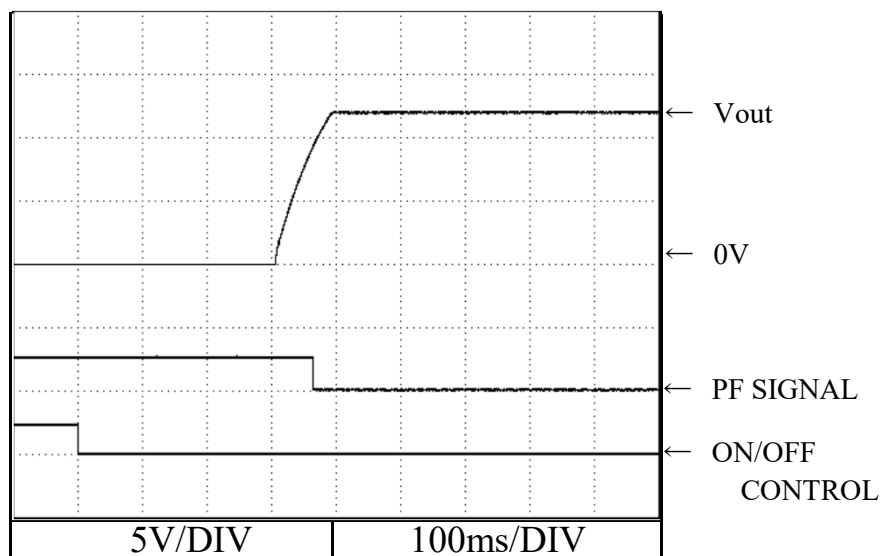
$I_{out}$  : 100 %

$T_a$  : 25 °C

5V



12V



## 2.7 ON/OFF コントロール時出力立ち上がり特性

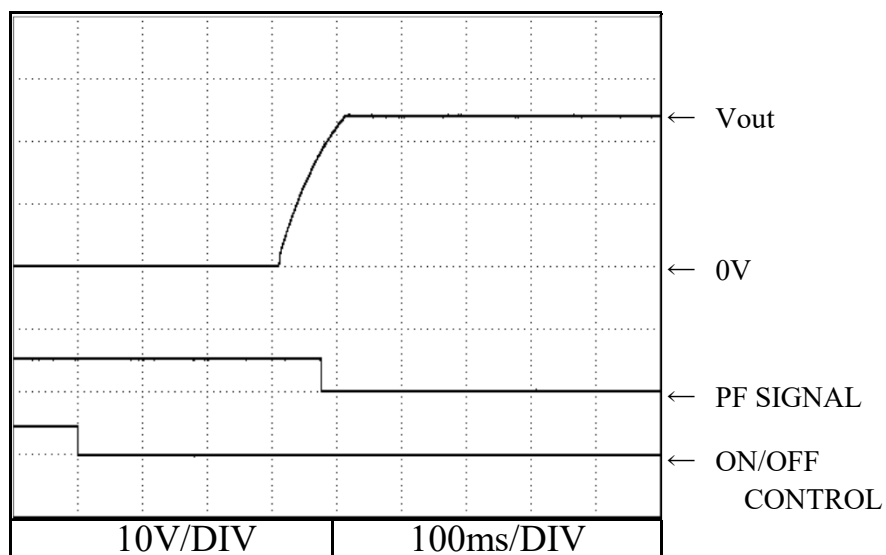
Output rise characteristics with ON/OFF CONTROL

Conditions  $V_{in}$  : 100 VAC

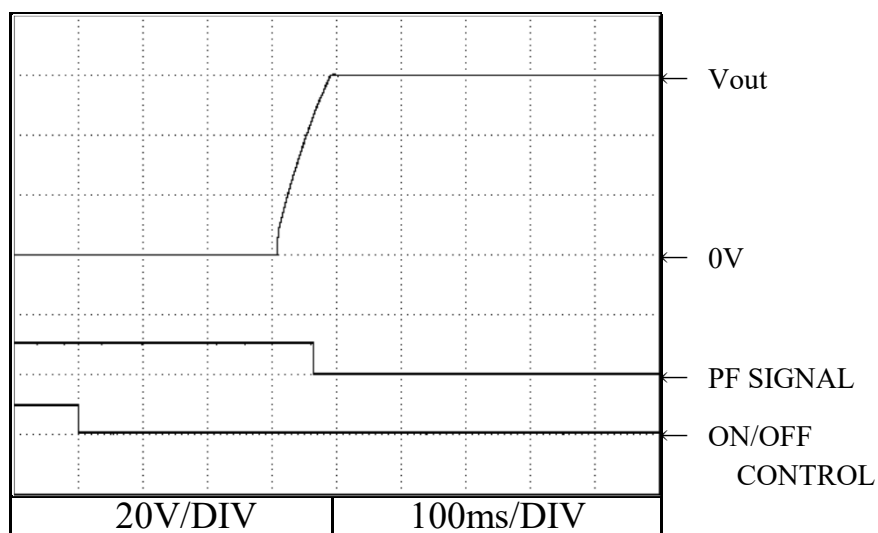
$I_{out}$  : 100 %

$T_a$  : 25 °C

24V



60V

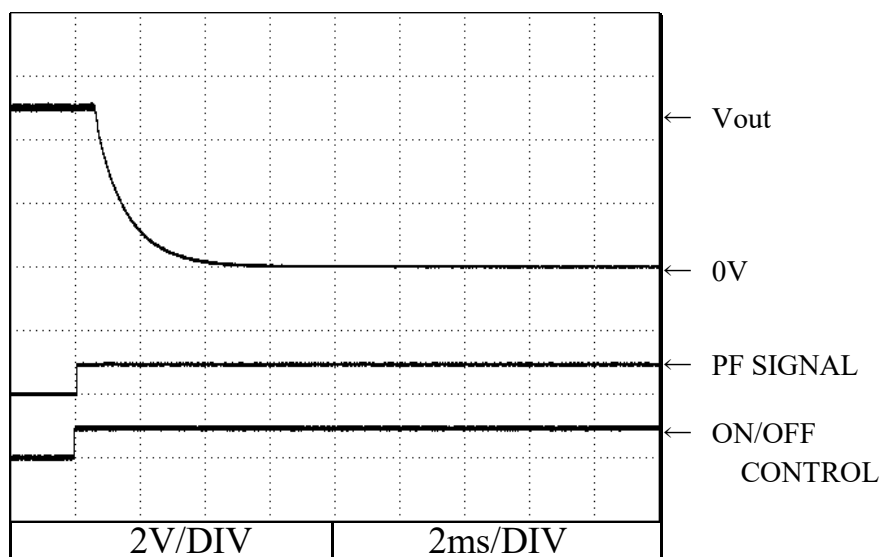


## 2.8 ON/OFF コントロール時出力立ち下がり特性

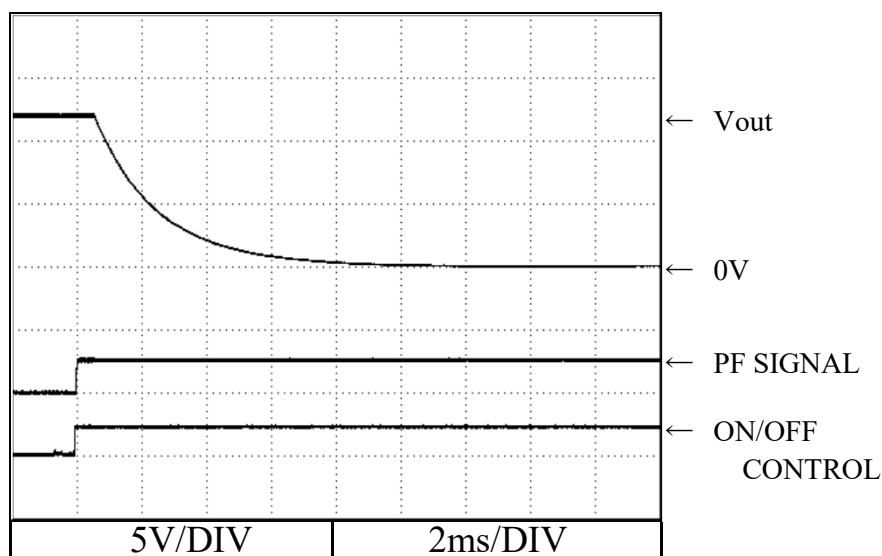
Output fall characteristics with ON/OFF CONTROL

Conditions Vin : 100 VAC  
Iout : 100 %  
Ta : 25 °C

5V



12V

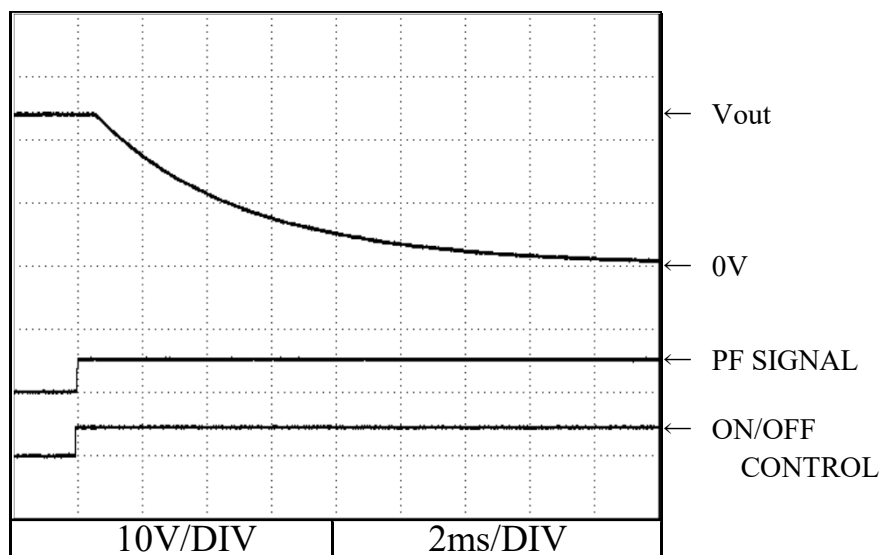


## 2.8 ON/OFF コントロール時出力立ち下がり特性

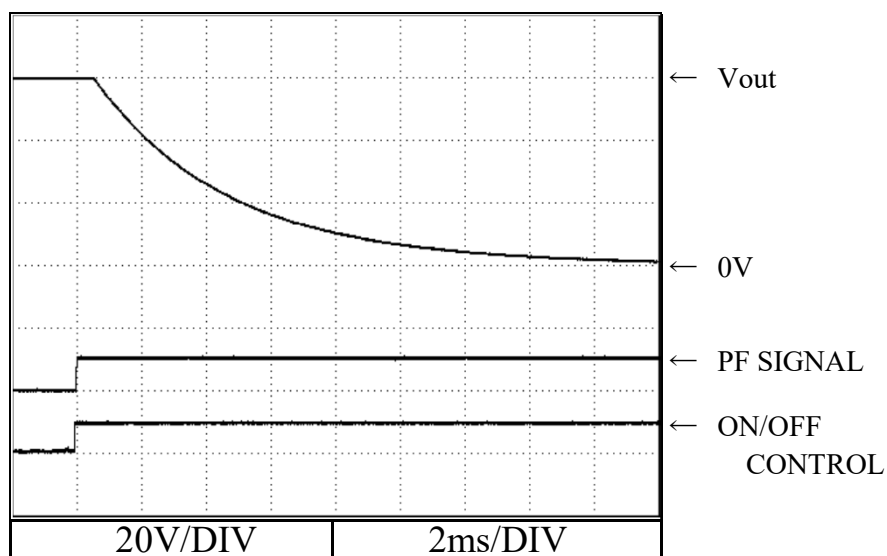
Output fall characteristics with ON/OFF CONTROL

Conditions Vin : 100 VAC  
Iout : 100 %  
Ta : 25 °C

24V



60V

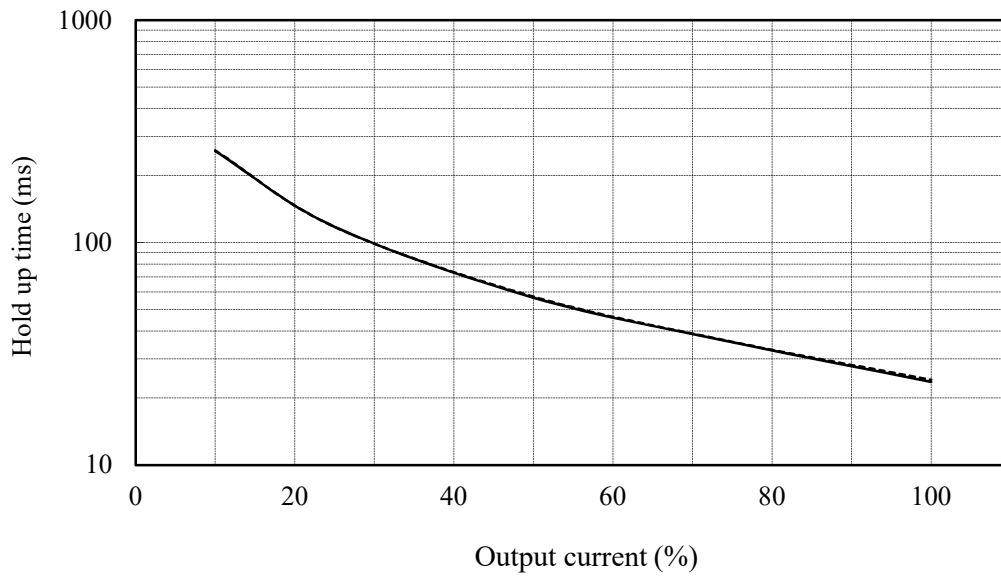


## 2.9 出力保持時間特性

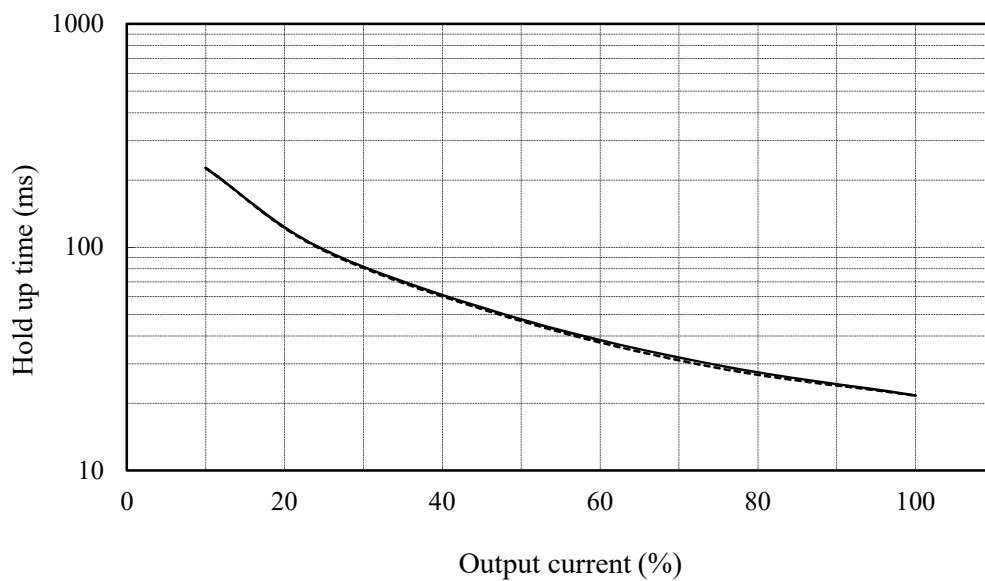
Hold up time characteristics

Conditions  $V_{in}$  : 100 VAC - - - - -  
                  200 VAC ————  
 $T_a$  : 25 °C

5V



12V

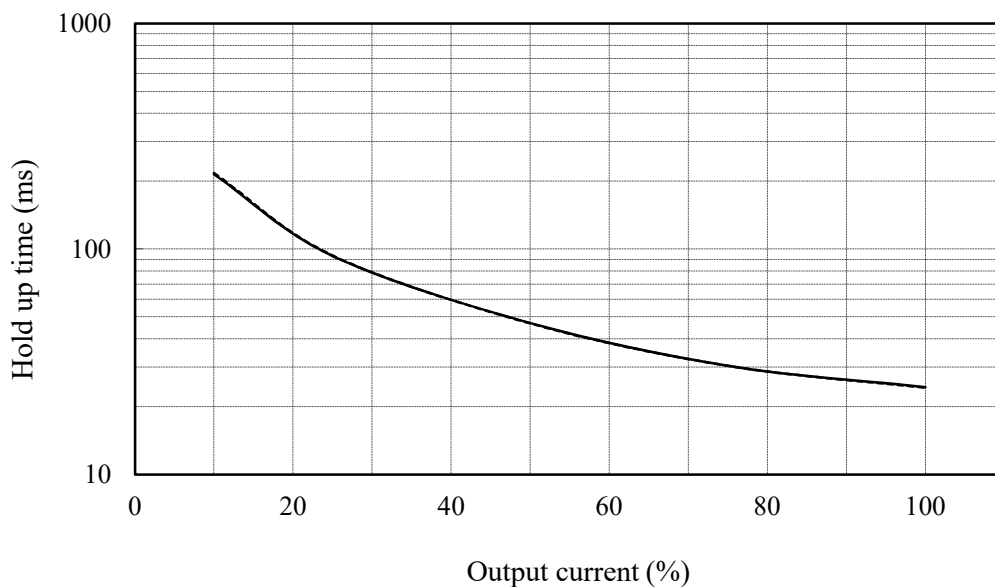


## 2.9 出力保持時間特性

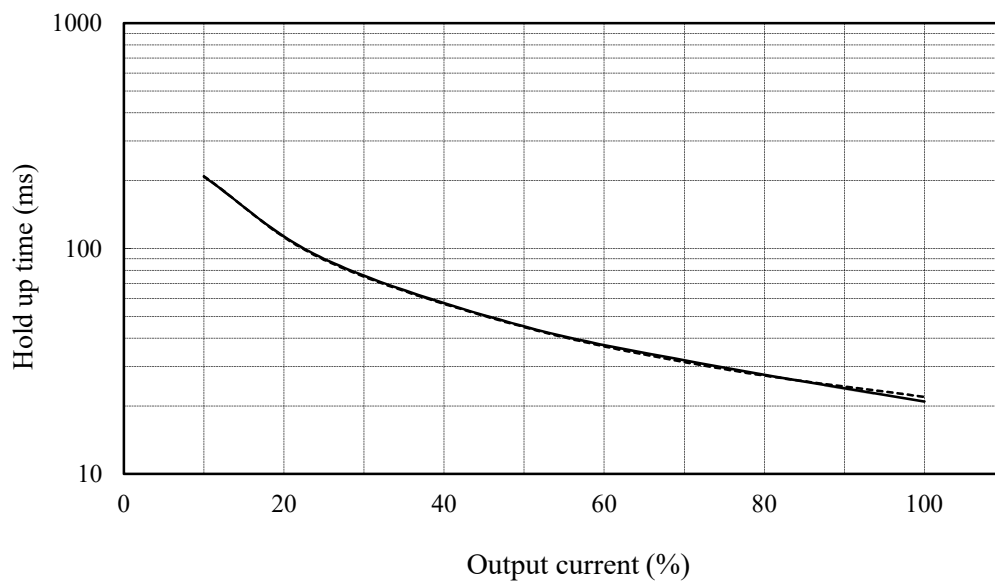
Hold up time characteristics

Conditions Vin : 100 VAC .....  
 200 VAC ———  
 Ta : 25 °C

24V



60V

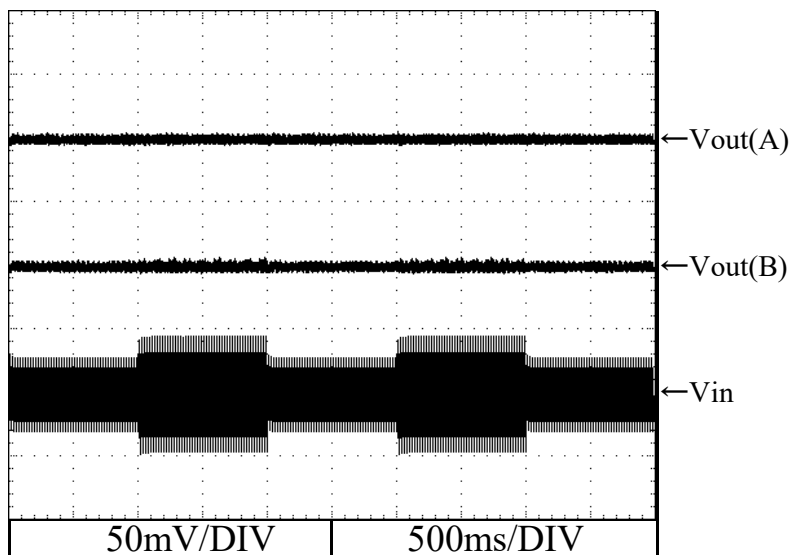


## 2.10 過渡応答（入力急変）特性

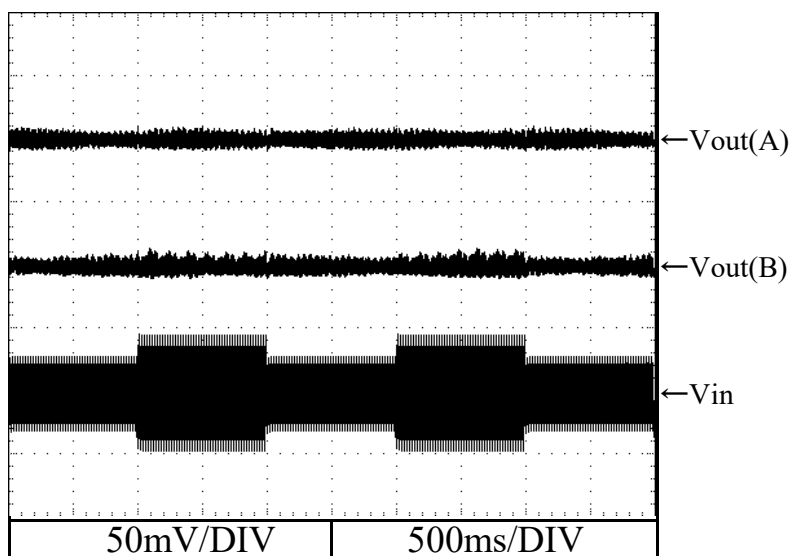
Dynamic line response characteristics

Conditions  $V_{in}$  : 85 VAC $\leftrightarrow$ 132VAC (A)  
170 VAC $\leftrightarrow$ 265VAC (B)  
 $I_{out}$  : 100 %  
 $T_a$  : 25 °C

5V



12V



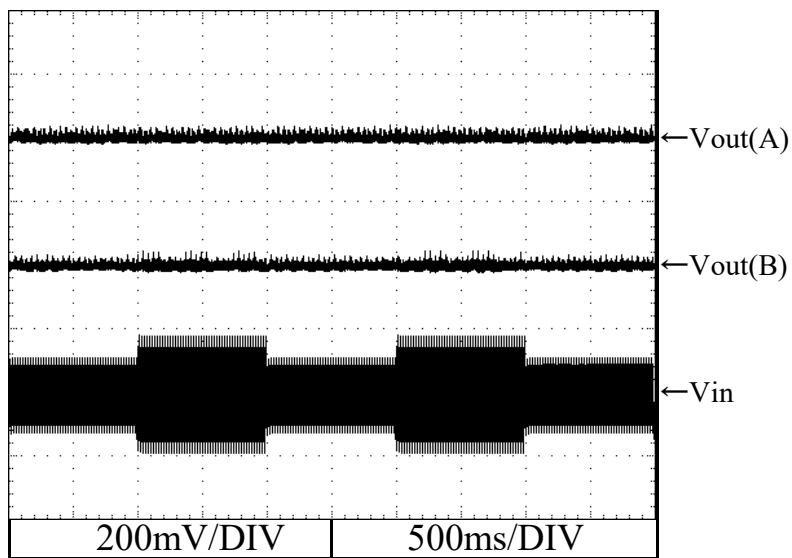


## 2.10 過渡応答（入力急変）特性

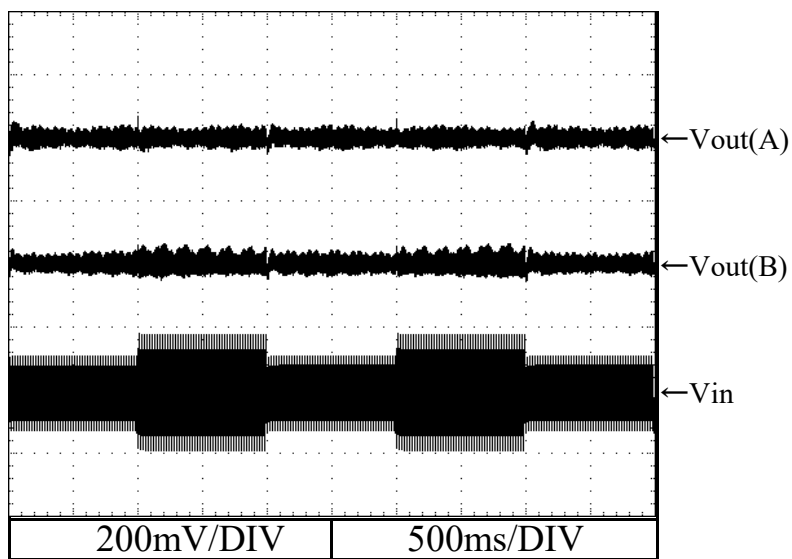
Dynamic line response characteristics

Conditions  $V_{in}$  : 85 VAC $\longleftrightarrow$ 132VAC (A)  
 170 VAC $\longleftrightarrow$ 265VAC (B)  
 $I_{out}$  : 100 %  
 $T_a$  : 25 °C

24V



60V



## 2.11 過渡応答（負荷急変）特性

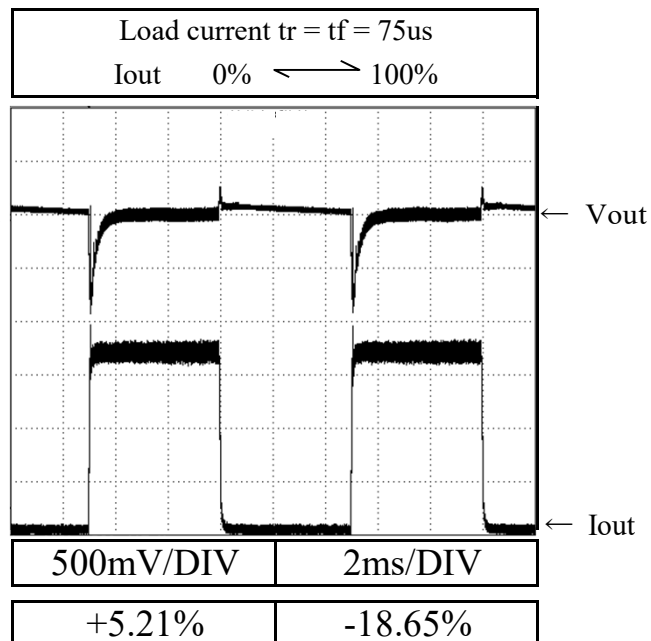
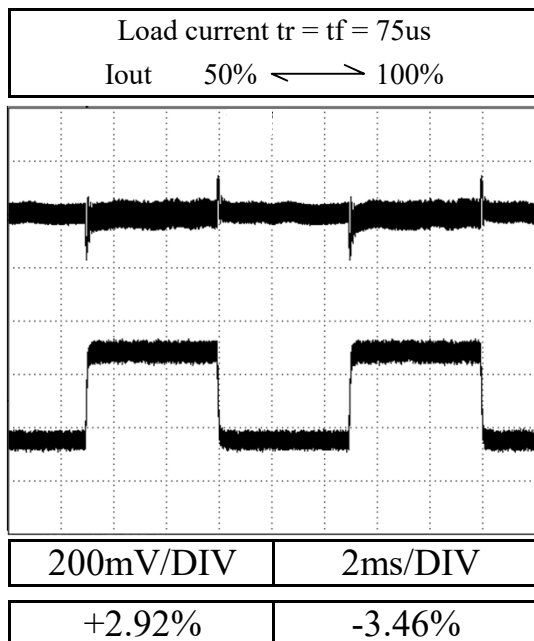
Dynamic load response characteristics

Conditions  $V_{in}$  : 100 VAC

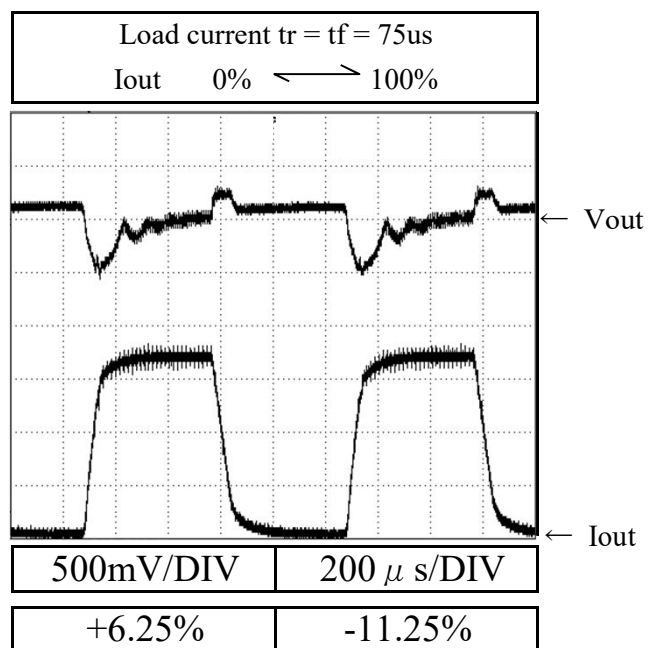
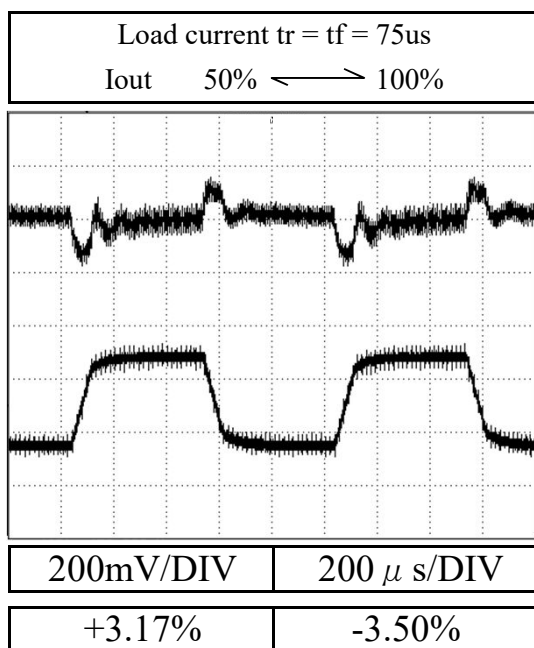
$T_a$  : 25 °C

5V

$f=100\text{Hz}$



$f=1\text{kHz}$



## 2.11 過渡応答（負荷急変）特性

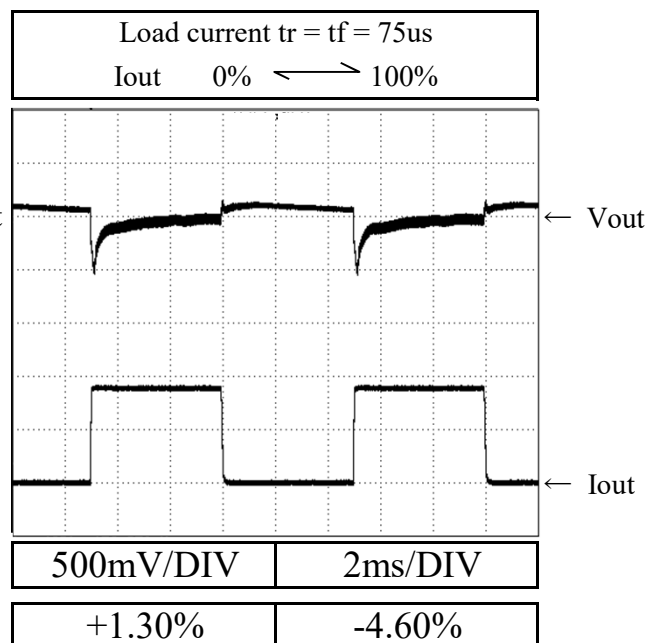
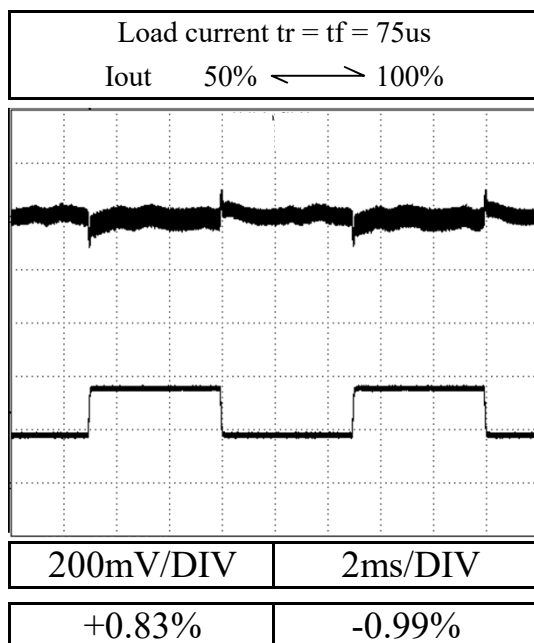
Dynamic load response characteristics

Conditions  $V_{in}$  : 100 VAC

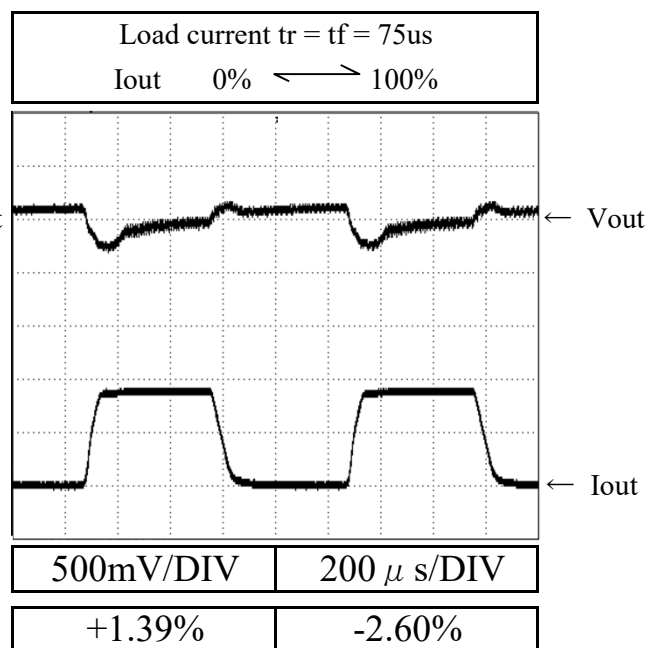
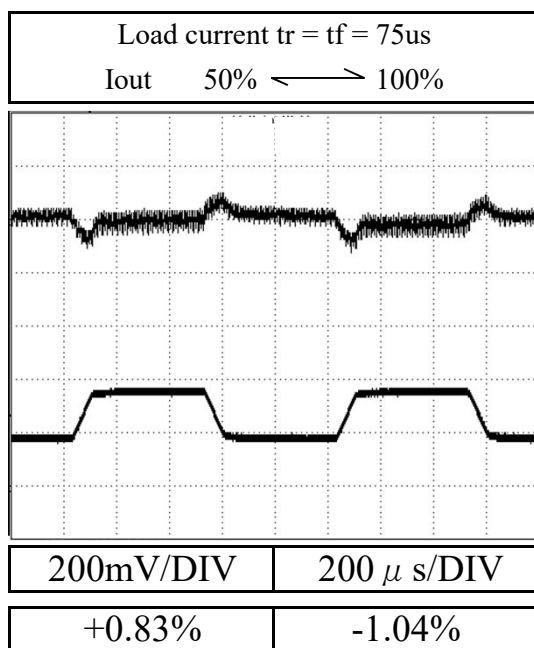
$T_a$  : 25 °C

12V

$f=100\text{Hz}$



$f=1\text{kHz}$



## 2.11 過渡応答（負荷急変）特性

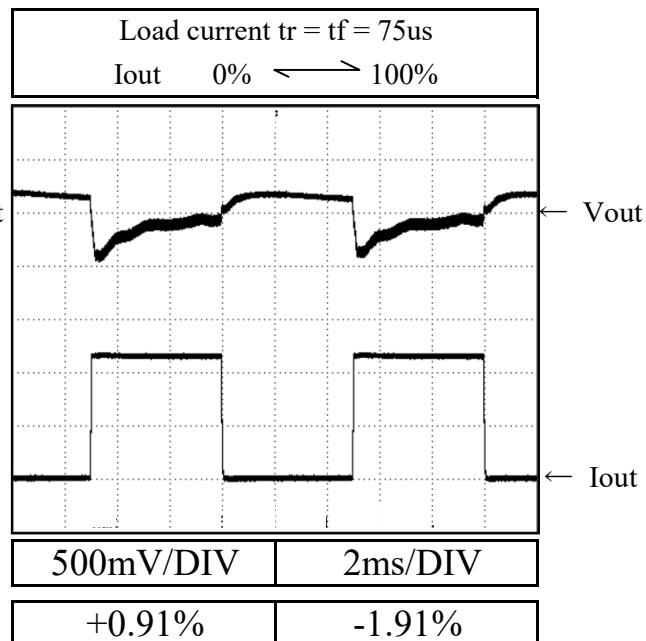
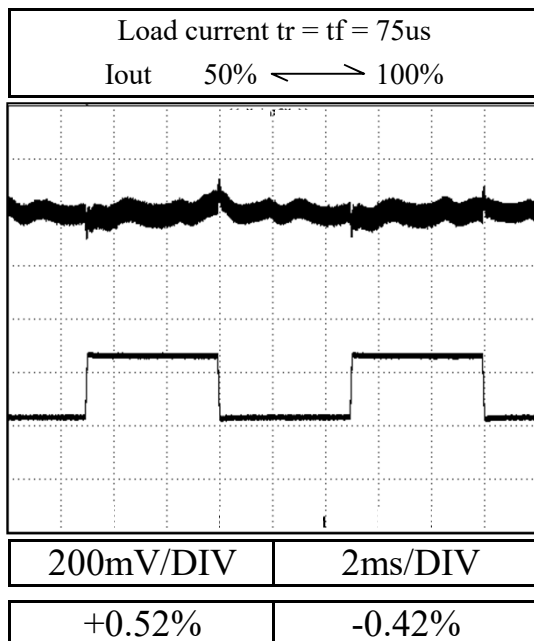
Dynamic load response characteristics

Conditions  $V_{in}$  : 100 VAC

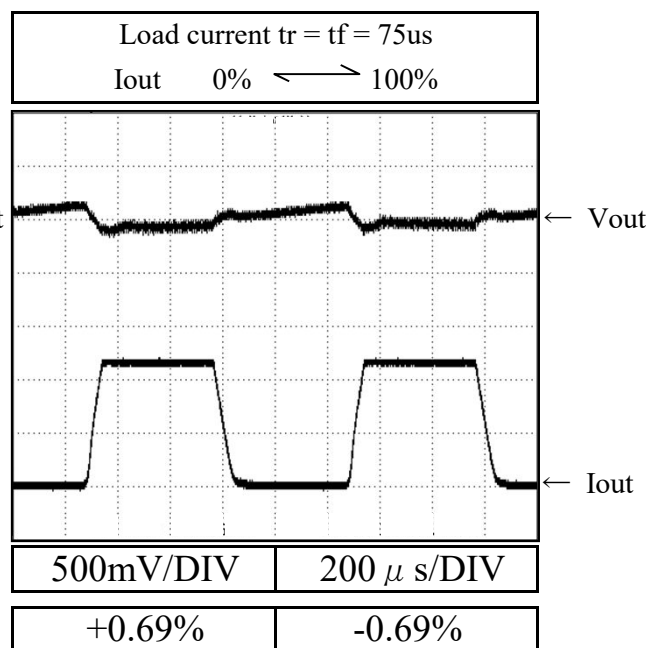
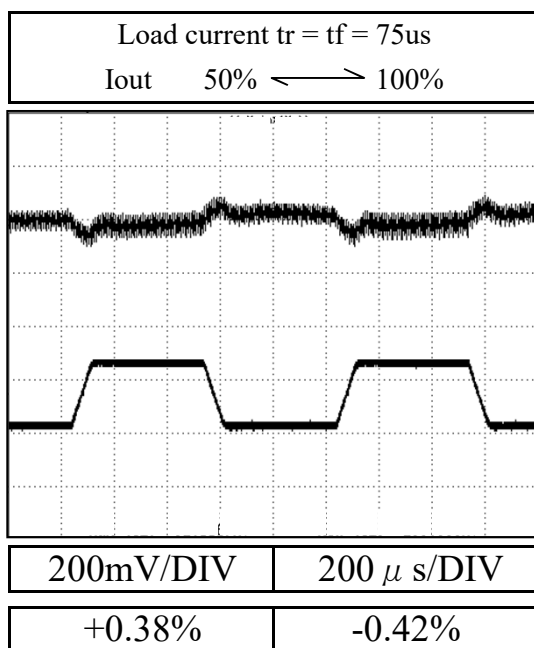
$T_a$  : 25 °C

24V

$f=100\text{Hz}$



$f=1\text{kHz}$



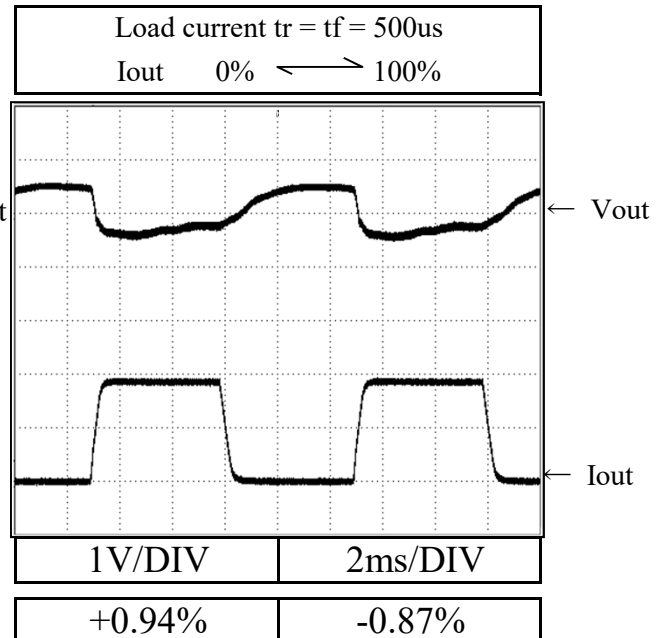
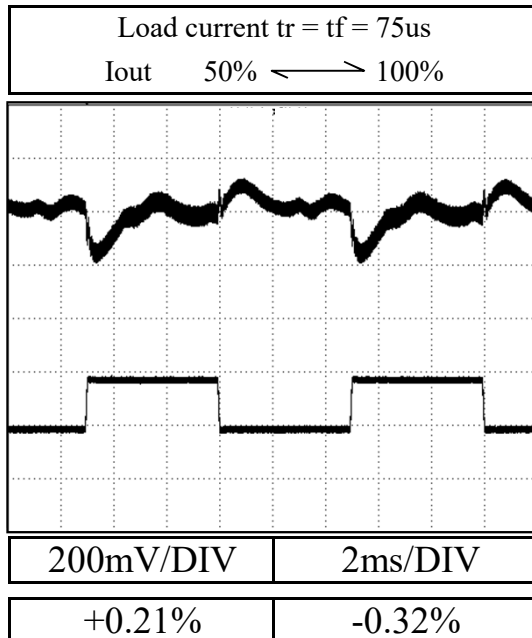
## 2.11 過渡応答（負荷急変）特性

Dynamic load response characteristics

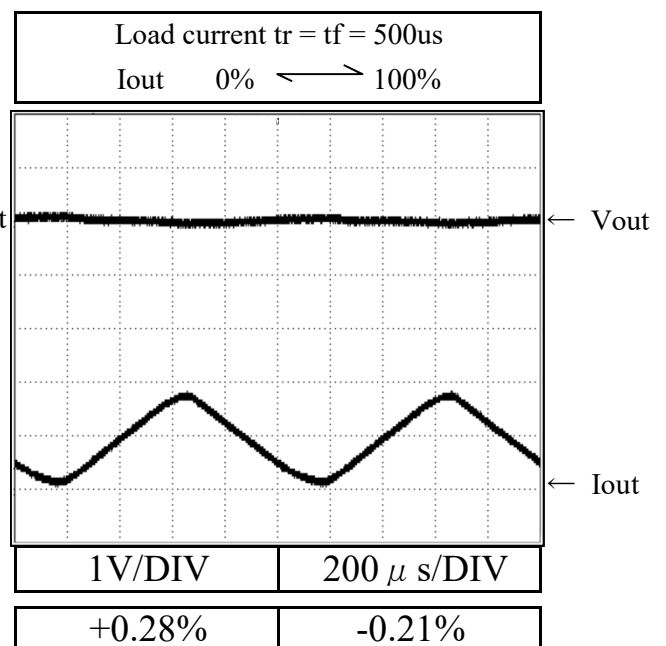
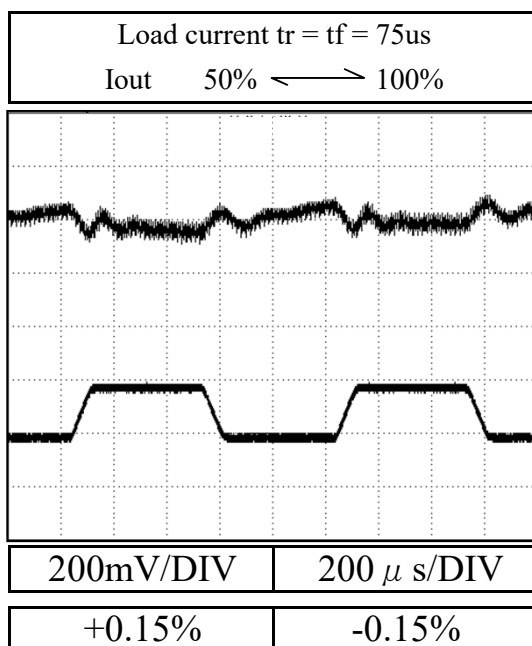
Conditions  $V_{in}$  : 100 VAC  
 $T_a$  : 25 °C

60V

$f=100\text{Hz}$



$f=1\text{kHz}$



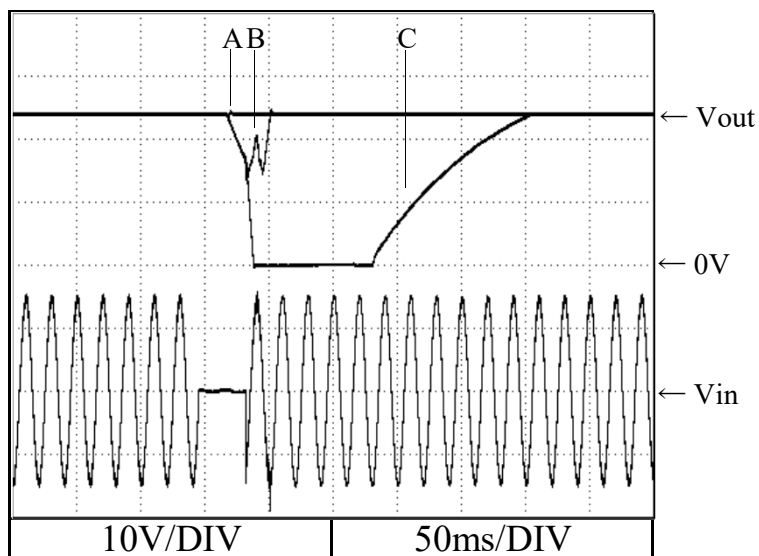
## 2.12 入力電圧瞬停特性

Response to brown out characteristics

Conditions  $V_{in}$  : 100 VAC  
 $I_{out}$  : 100 %  
 $T_a$  : 25 °C

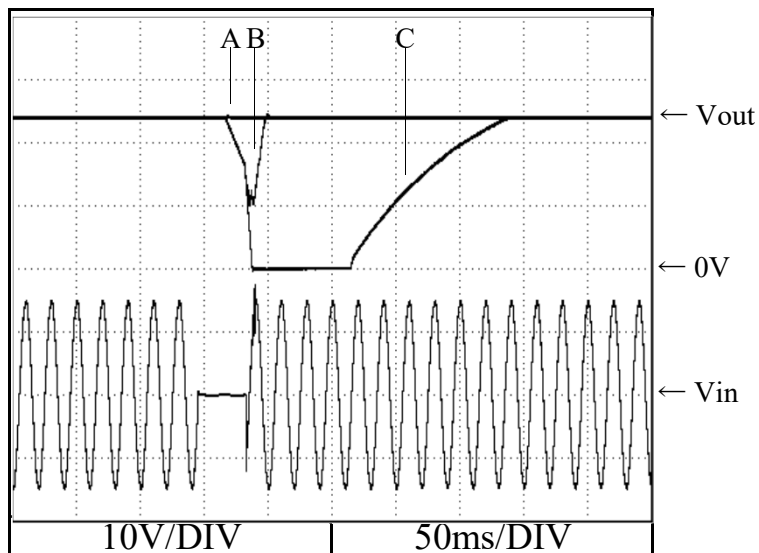
24V

A = 22ms  
 B = 35ms  
 C = 36ms



Conditions  $V_{in}$  : 200 VAC  
 $I_{out}$  : 100 %  
 $T_a$  : 25 °C

A = 22ms  
 B = 36ms  
 C = 37ms

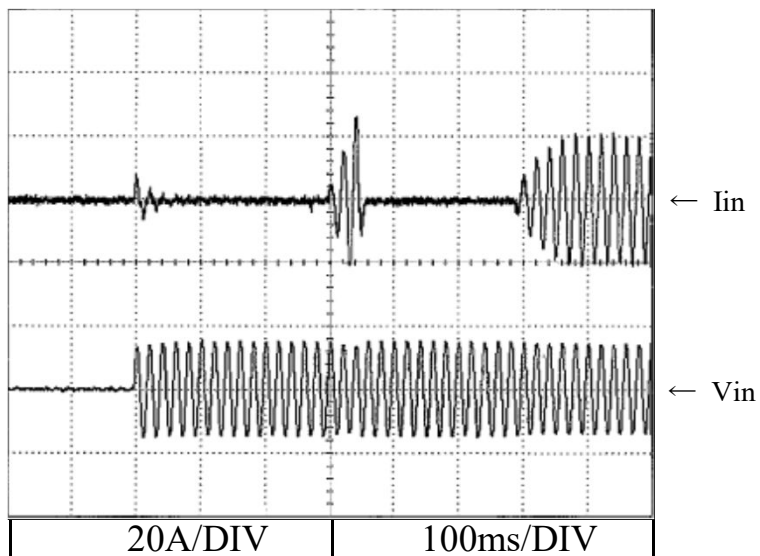


2.13 入力サージ電流（突入電流）特性  
Inrush current waveform

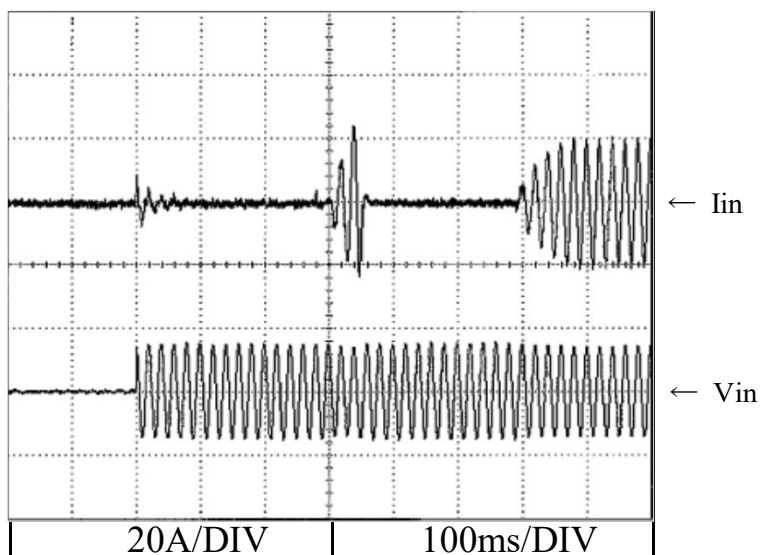
Conditions Vin : 100 VAC  
Iout : 100 %  
Ta : 25 °C

24V

Switch on phase angle  
of input AC voltage  
 $\phi = 0^\circ$



Switch on phase angle  
of input AC voltage  
 $\phi = 90^\circ$

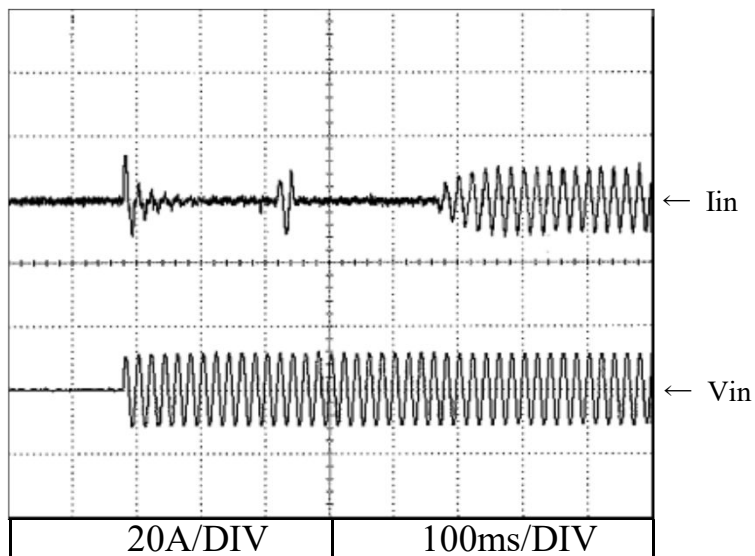


2.13 入力サージ電流（突入電流）特性  
Inrush current waveform

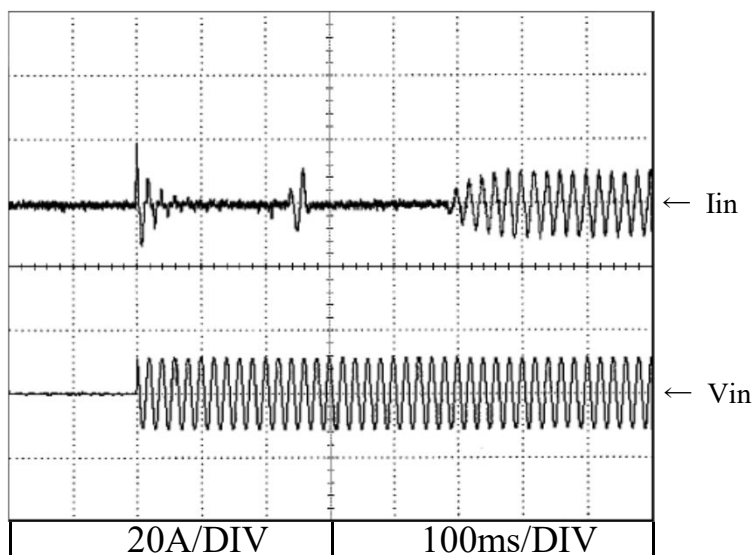
Conditions Vin : 200 VAC  
Iout : 100 %  
Ta : 25 °C

24V

Switch on phase angle  
of input AC voltage  
 $\phi = 0^\circ$



Switch on phase angle  
of input AC voltage  
 $\phi = 90^\circ$



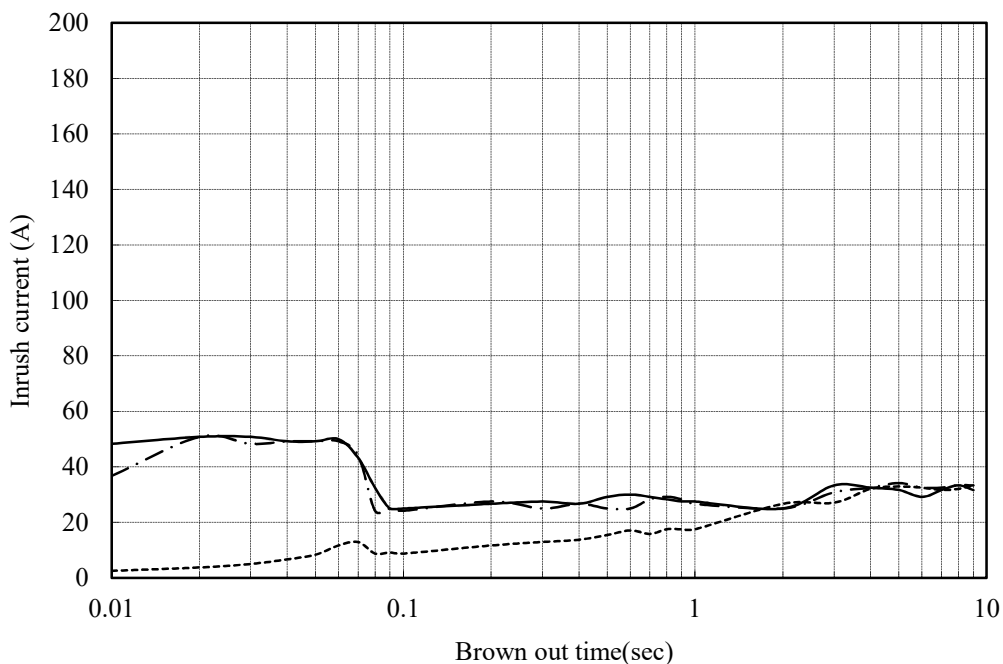


## 2.14 瞬停時突入電流特性 Inrush current characteristics

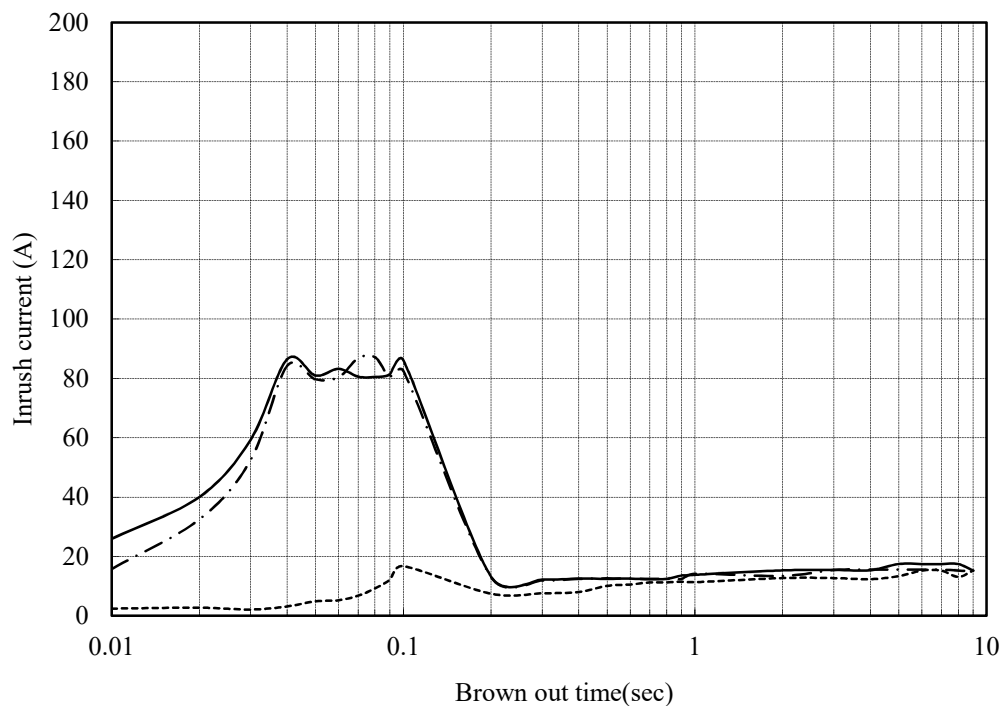
Conditions Iout : 0 %    - - - - -  
                   50 %    - · - · -  
                   100 %    ————  
 Ta : 25 °C

24V

Vin : 100 VAC



Vin : 200 VAC



※ 上記値は、2次突入電流を含んだ値である。  
 Above data includes secondary inrush current.

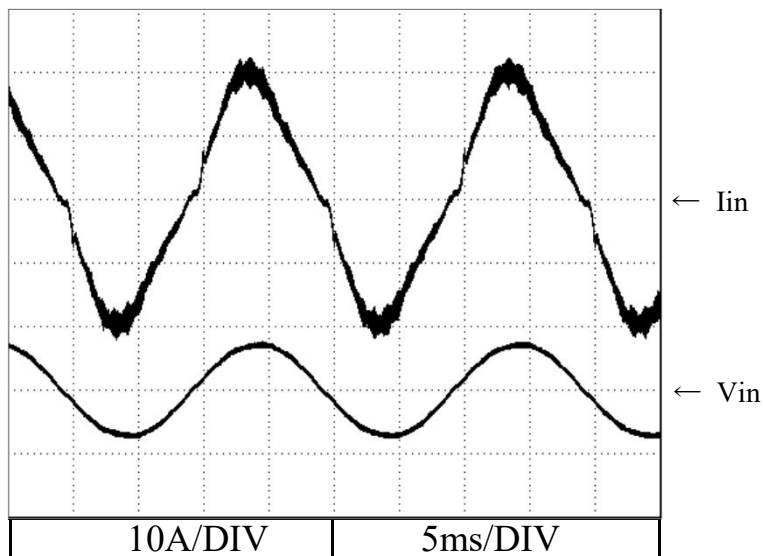
2.15 入力電流波形

Input current waveform

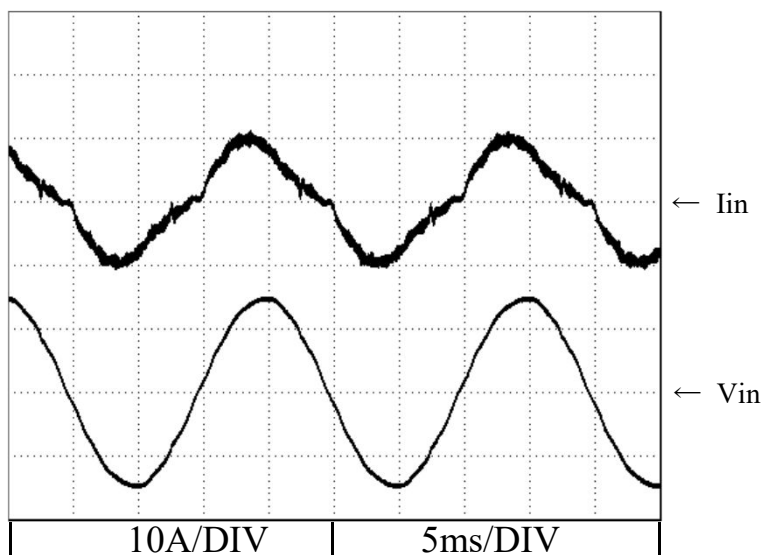
Conditions Iout : 100 %  
Ta : 25 °C

24V

Vin : 100 VAC



Vin : 200 VAC



## 2.16 高調波成分

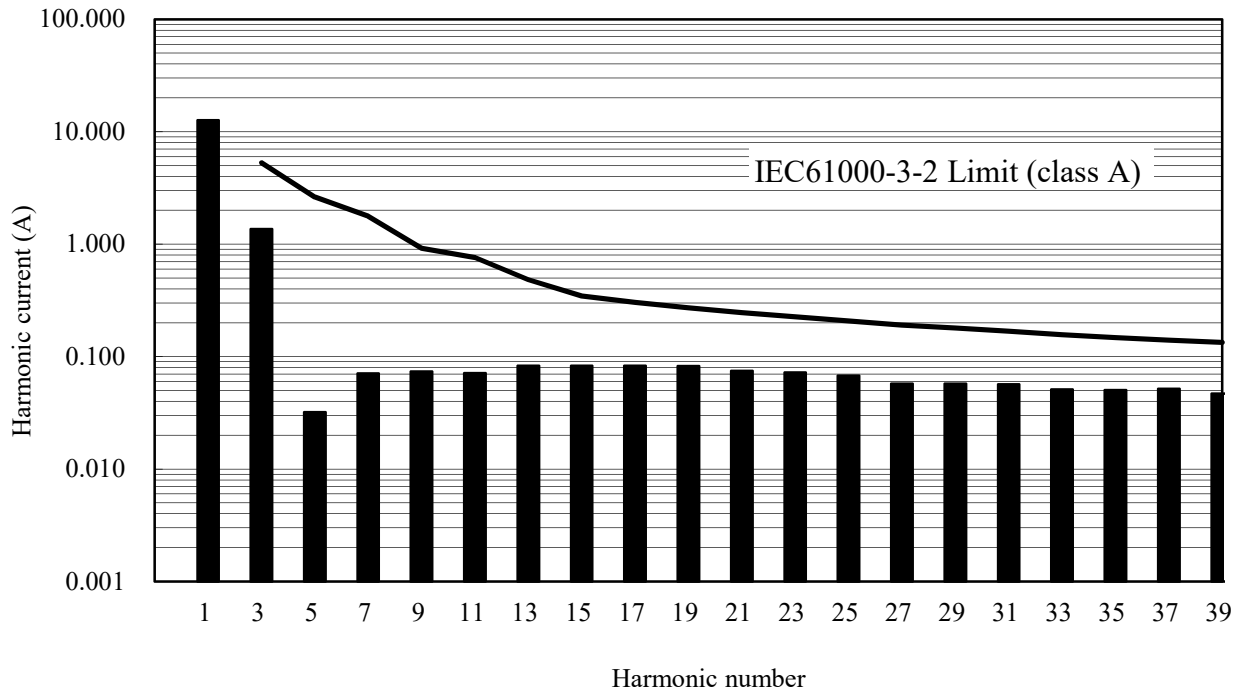
Input current harmonics

Conditions Vin : 100VAC

Iout : 100%

Ta : 25°C

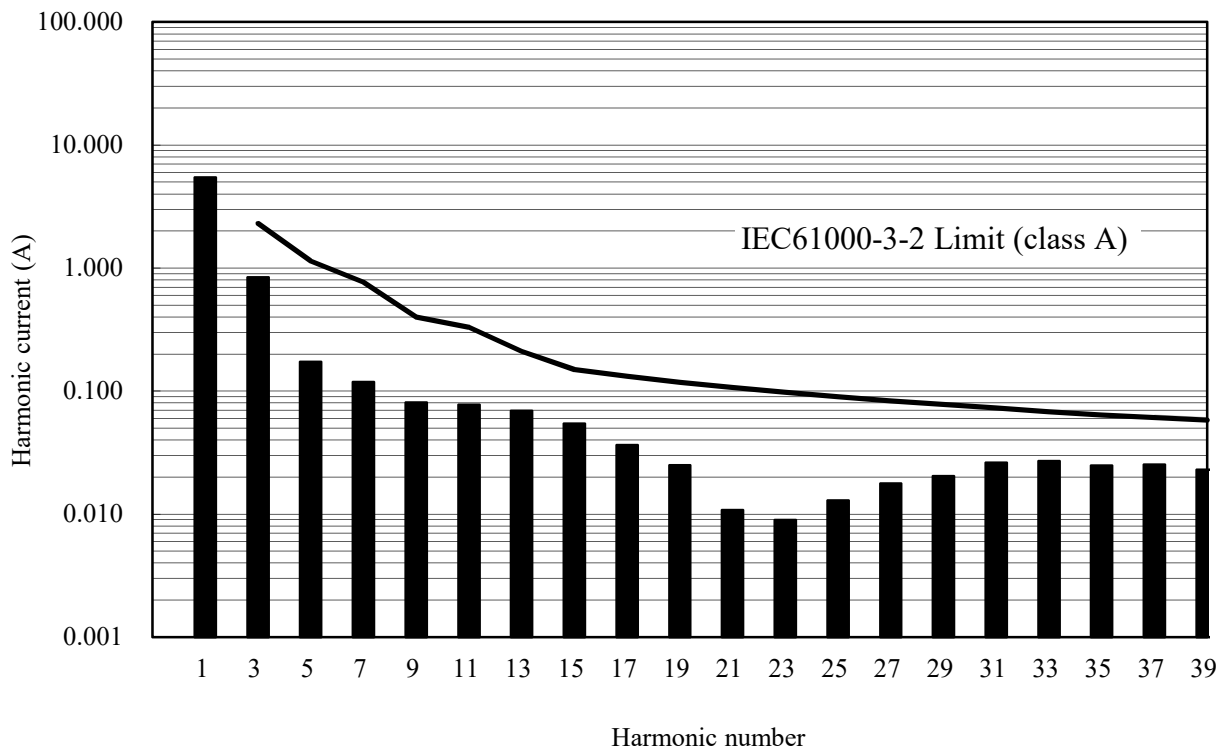
48V



Conditions Vin : 230VAC

Iout : 100%

Ta : 25°C

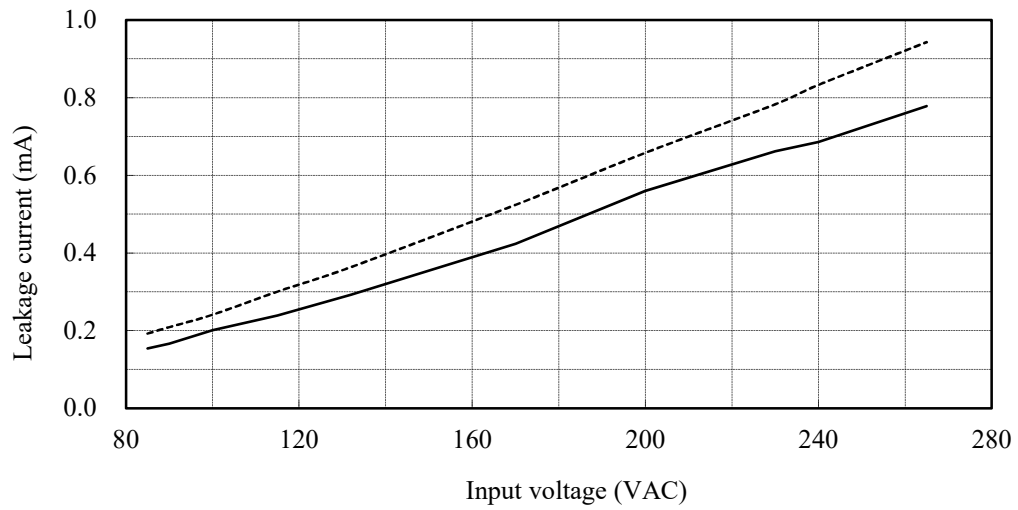


## 2.17 リーク電流特性

Leakage current characteristics

Conditions Iout : 0 % .....  
                  100 % ——  
                  Ta : 25 °C  
                  f : 50 Hz  
Equipment used : 3155(HIOKI)

5V

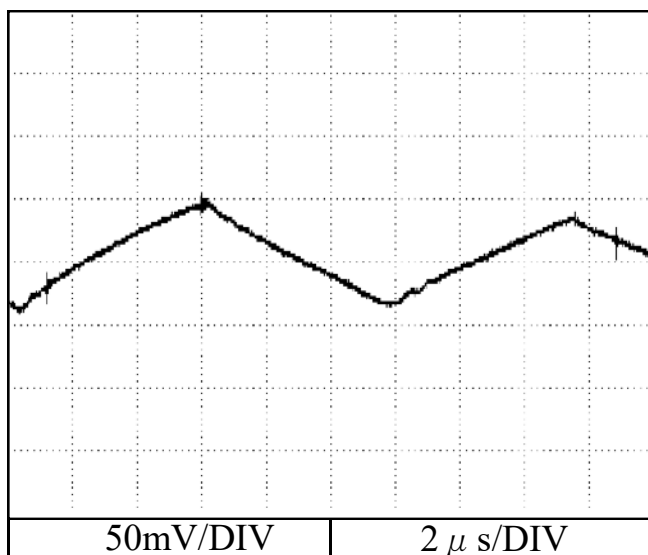


2.18 出力リップル、ノイズ波形  
Output ripple and noise waveform

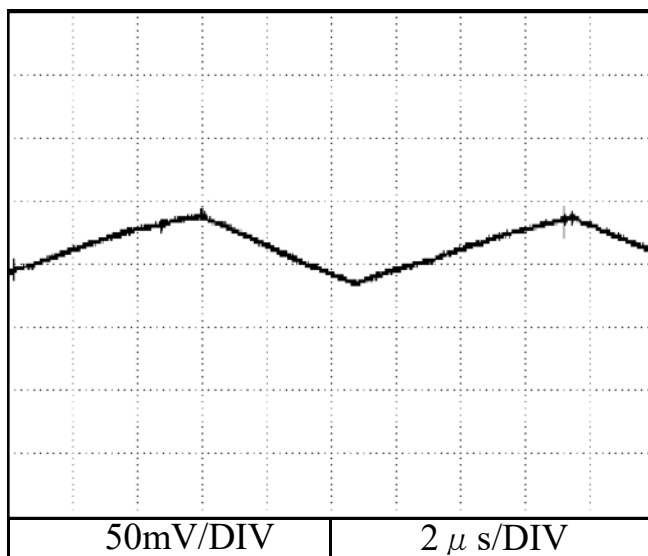
Conditions Vin : 200 VAC  
Iout : 100 %  
Ta : 25 °C

NORMAL MODE

5V



12V



2.18 出力リップル、ノイズ波形

Output ripple and noise waveform

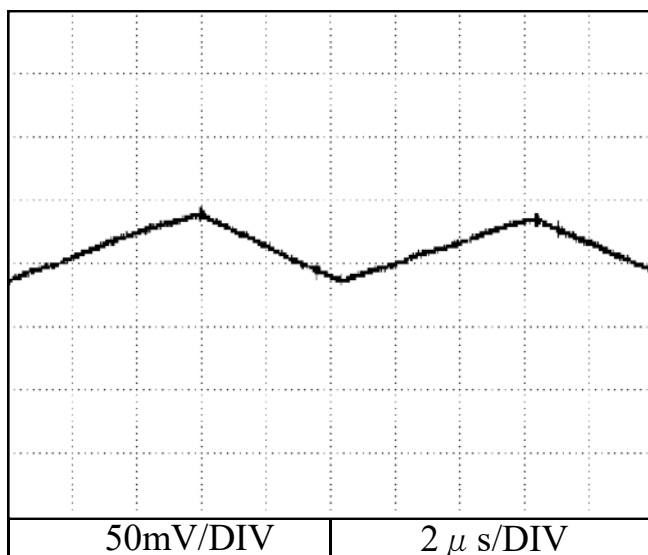
Conditions Vin : 200 VAC

Iout : 100 %

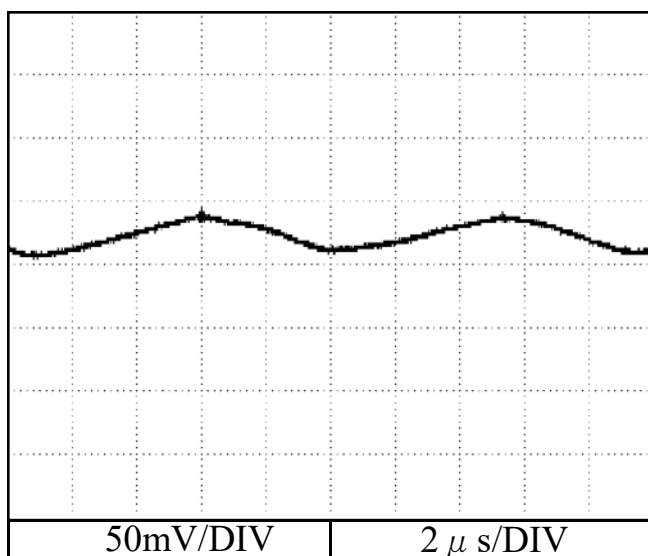
Ta : 25 °C

NORMAL MODE

24V



60V

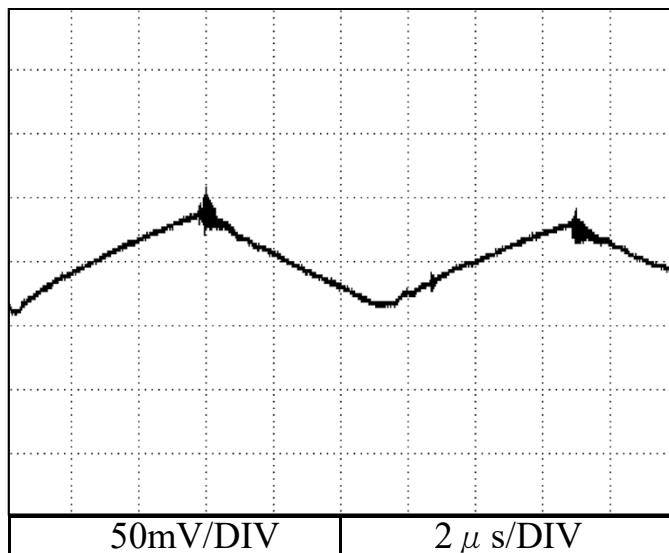


2.18 出力リップル、ノイズ波形  
Output ripple and noise waveform

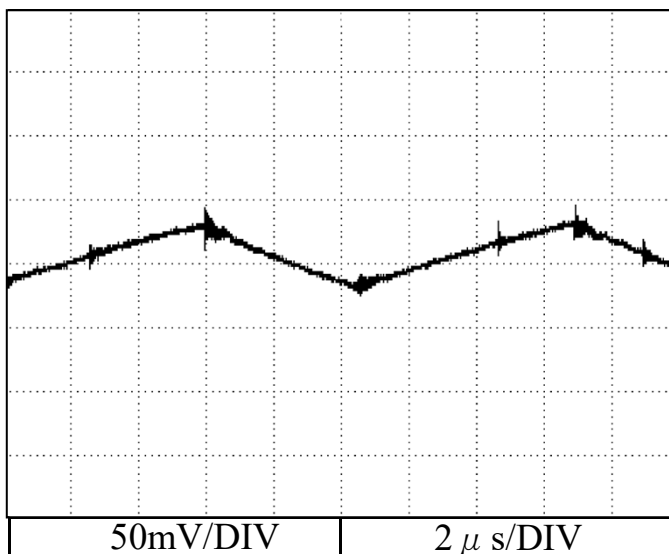
Conditions Vin : 200 VAC  
Iout : 100 %  
Ta : 25 °C

NORMAL + COMMON MODE

5V



12V

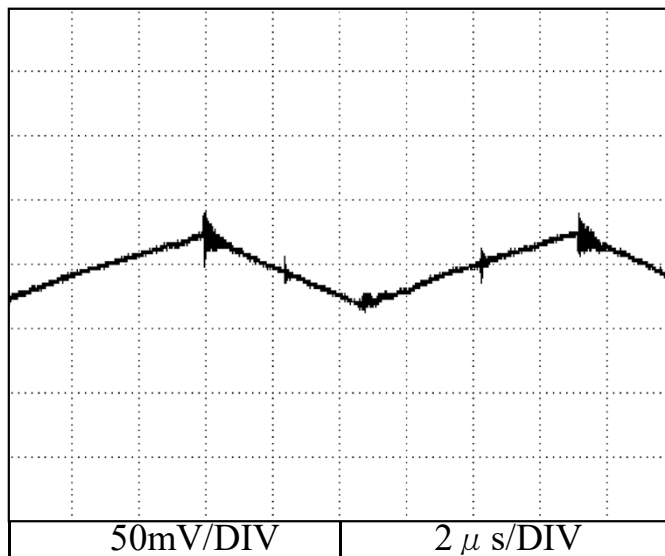


## 2.18 出力リップル、ノイズ波形 Output ripple and noise waveform

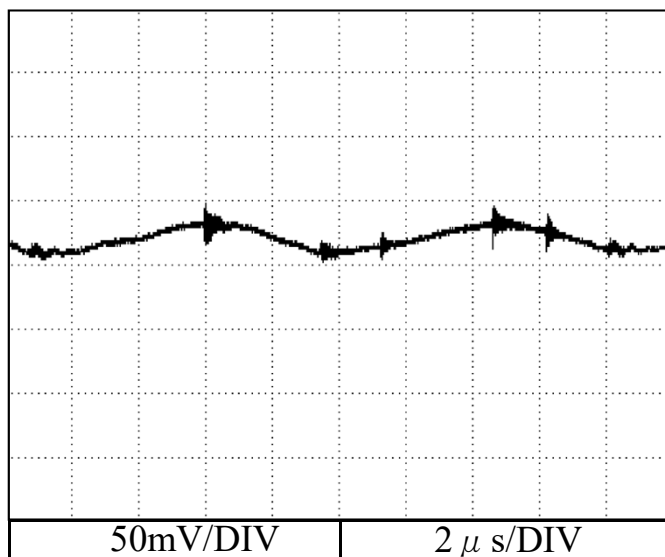
Conditions Vin : 200 VAC  
Iout : 100 %  
Ta : 25 °C

NORMAL + COMMON MODE

24V



60V





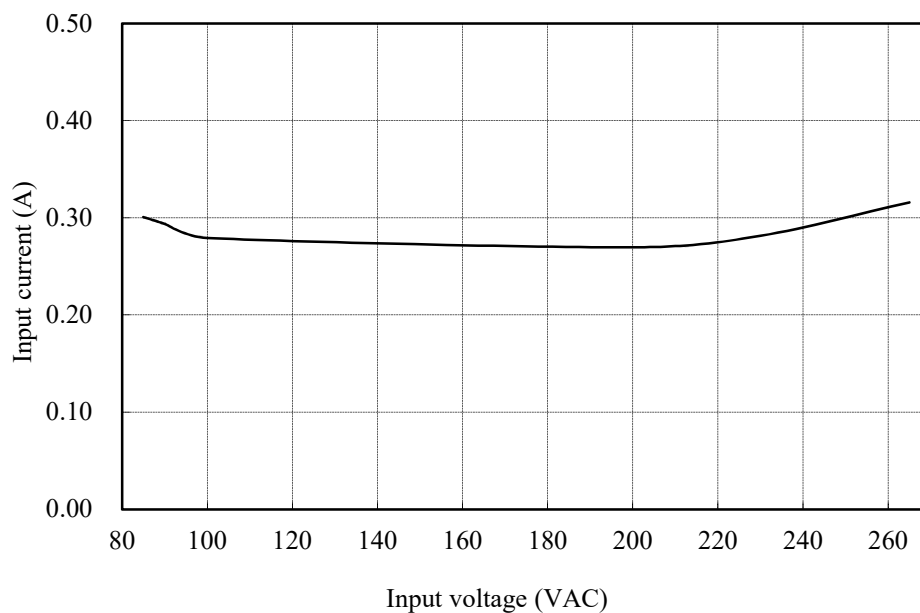
## 2.19 スタンバイ電流

Stand-by current

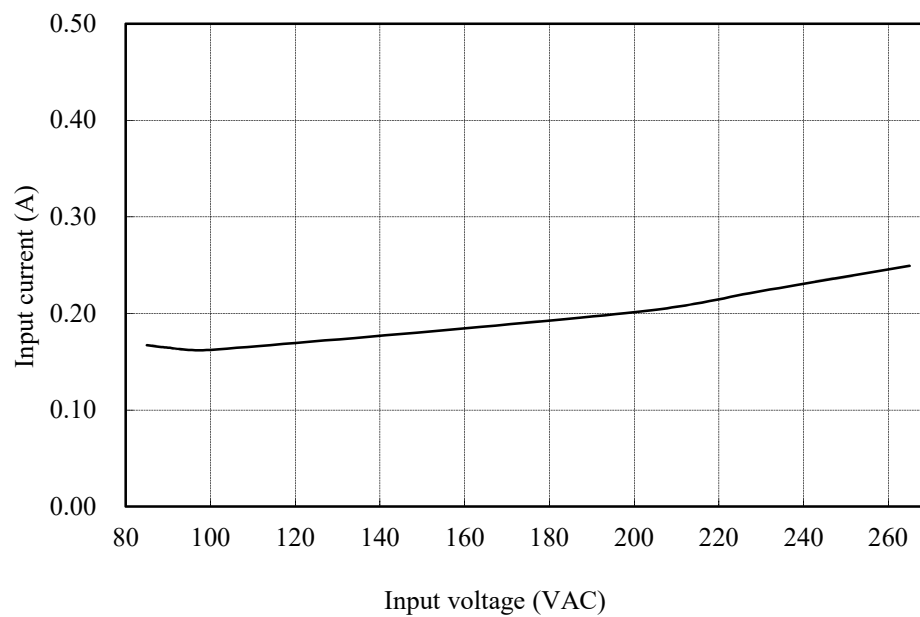
Condition Ta: 25 °C

24V

**Io = 0%**



**Remote control OFF**



## 2.20 EMI 特性

Electro-Magnetic Interference characteristics

Conditions  $V_{in}$  : 230VAC

$I_{out}$  : 100%

雑音端子電圧

Conducted Emission

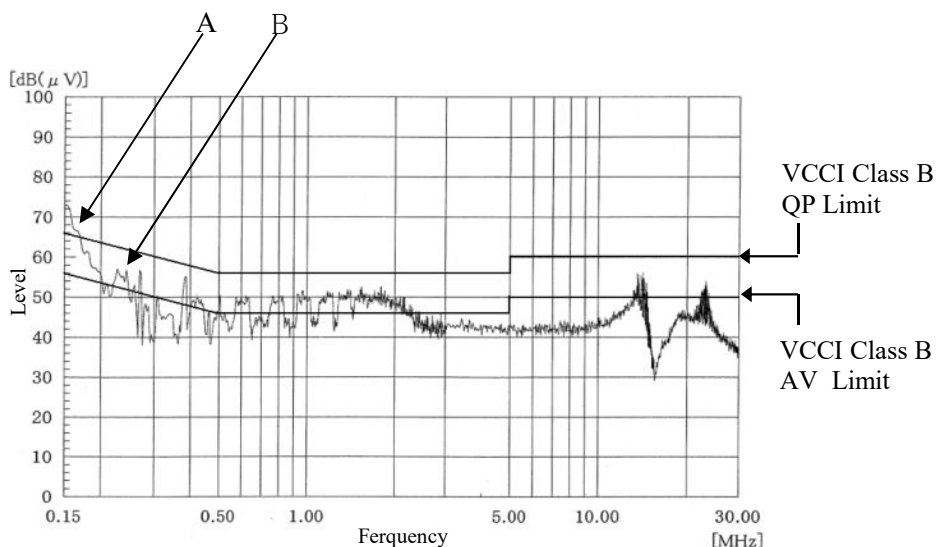
5V

Point A (169kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	65.0	56.7
AV	55.0	48.3

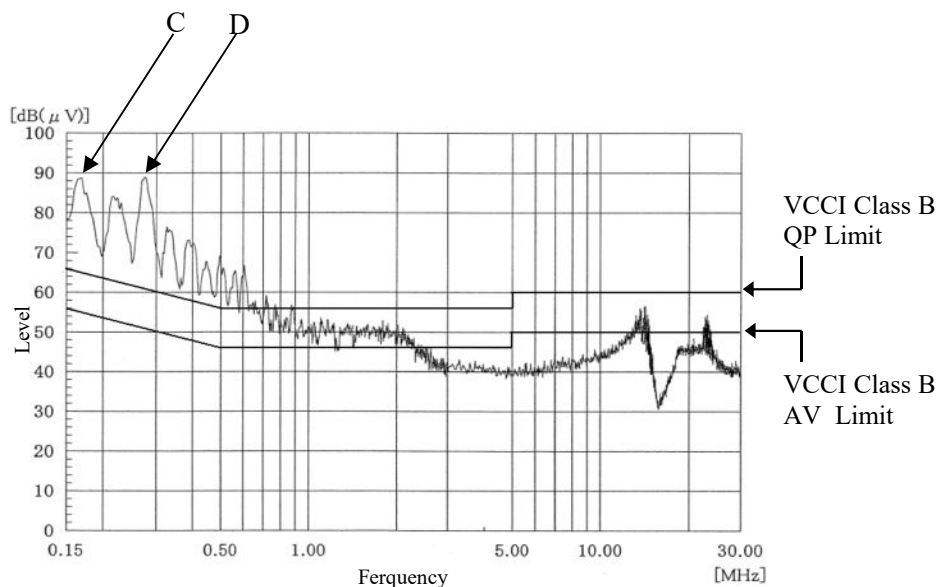
Point B (236kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	62.2	50.2
AV	52.2	41.6

Point C (168kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	65.1	59.7
AV	55.1	49.7

Point D (279kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	60.9	36.5
AV	50.9	34.7



Phase : N



Phase : L

EN55011-B,EN55032-Bの限界値はVCCI class Bの限界値と同じ

Limit of EN55011-B,EN55032-B are same as its VCCI class B.

上記は、尖頭値検波(PK)方式にて測定した波形です。

The above is wave measured by the peak detection mode.

## 2.20 EMI 特性

Electro-Magnetic Interference characteristics

Conditions  $V_{in}$  : 230VAC

$I_{out}$  : 100%

雑音端子電圧

Conducted Emission

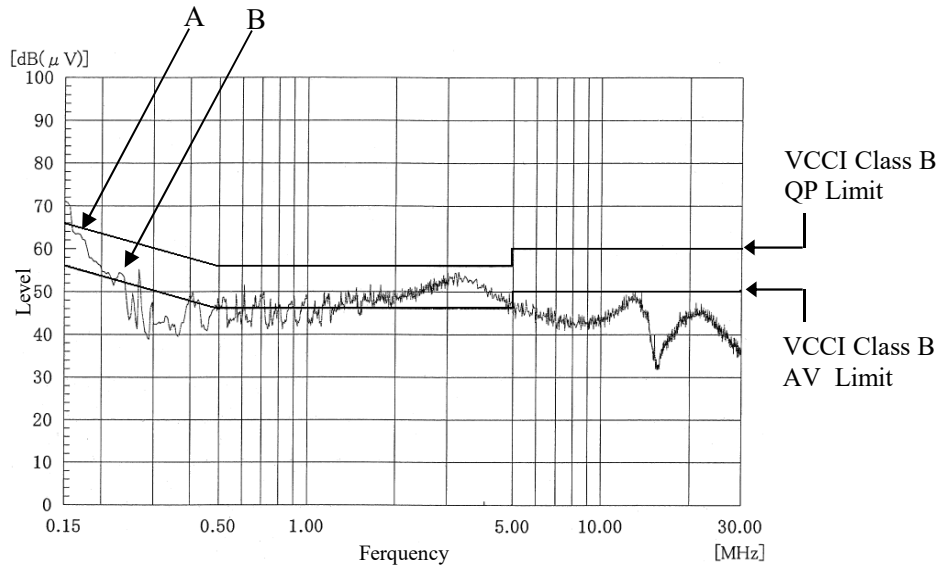
12V

Point A (170kHz)		
Ref. Data	Limit (dB $\mu$ V)	Measure (dB $\mu$ V)
QP	65.0	57.6
AV	55.0	43.9

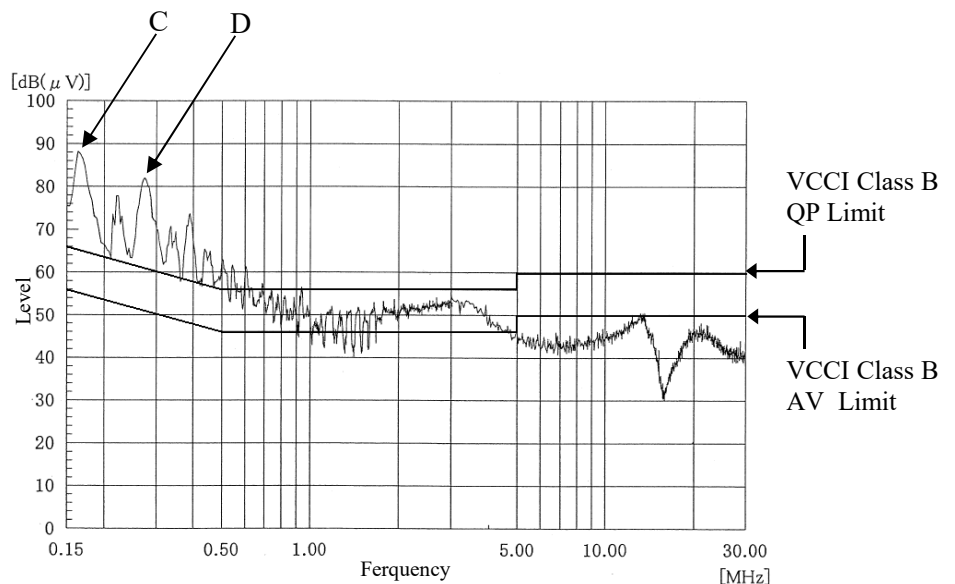
Point B (232kHz)		
Ref. Data	Limit (dB $\mu$ V)	Measure (dB $\mu$ V)
QP	62.4	51.0
AV	52.4	43.8

Point C (170kHz)		
Ref. Data	Limit (dB $\mu$ V)	Measure (dB $\mu$ V)
QP	65.0	59.9
AV	55.0	46.4

Point D (278kHz)		
Ref. Data	Limit (dB $\mu$ V)	Measure (dB $\mu$ V)
QP	60.9	35.7
AV	50.9	32.1



Phase : N



Phase : L

EN55011-B,EN55032-Bの限界値はVCCI class Bの限界値と同じ

Limit of EN55011-B,EN55032-B are same as its VCCI class B.

上記は、尖頭値検波(PK)方式にて測定した波形です。

The above is wave measured by the peak detection mode.

## 2.20 EMI 特性

Electro-Magnetic Interference characteristics

Conditions  $V_{in}$  : 230VAC

$I_{out}$  : 100%

雑音端子電圧

Conducted Emission

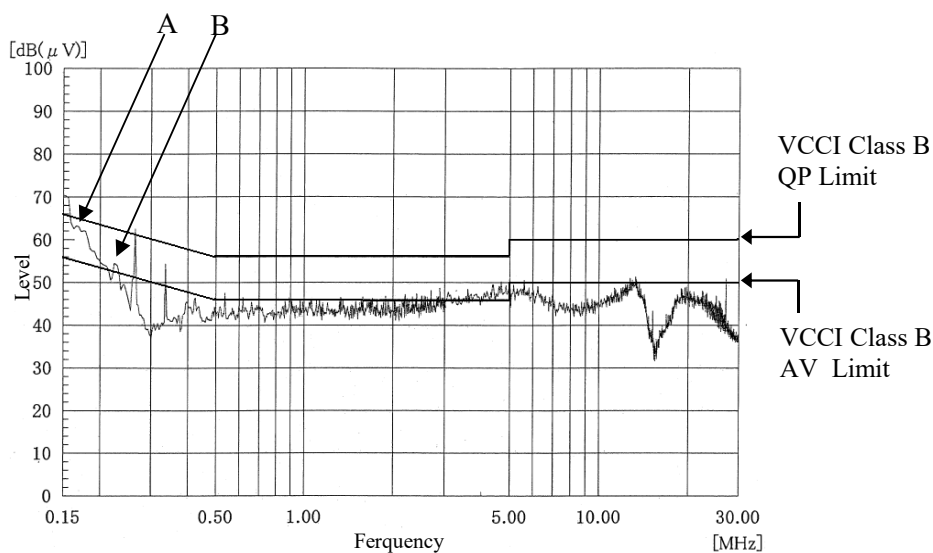
24V

Point A (169kHz)		
Ref. Data	Limit (dB $\mu$ V)	Measure (dB $\mu$ V)
QP	65.0	58.0
AV	55.0	44.1

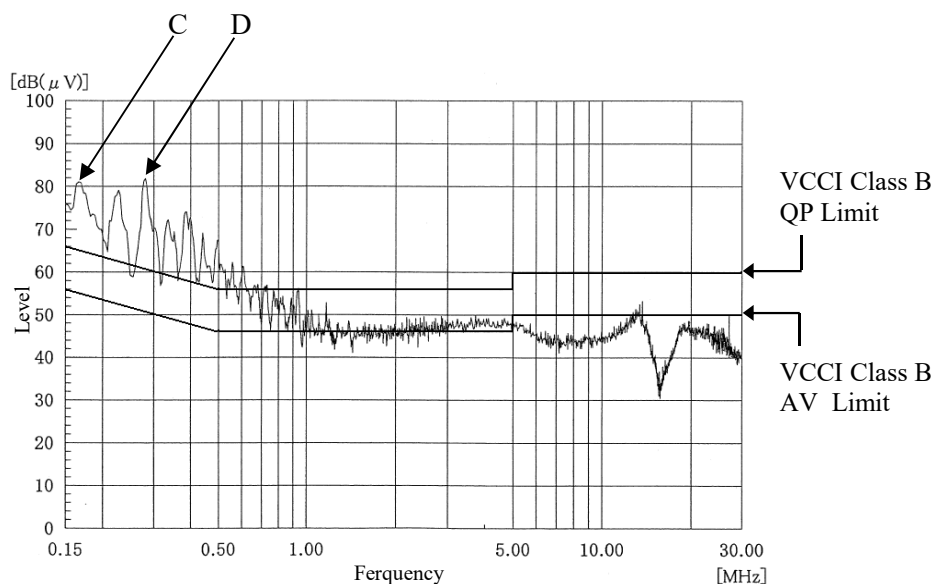
Point B (235kHz)		
Ref. Data	Limit (dB $\mu$ V)	Measure (dB $\mu$ V)
QP	62.3	46.9
AV	52.3	39.9

Point C (169kHz)		
Ref. Data	Limit (dB $\mu$ V)	Measure (dB $\mu$ V)
QP	65.0	60.1
AV	55.0	46.6

Point D (279kHz)		
Ref. Data	Limit (dB $\mu$ V)	Measure (dB $\mu$ V)
QP	60.9	45.2
AV	50.9	32.8



Phase : N



Phase : L

EN55011-B,EN55032-Bの限界値はVCCI class Bの限界値と同じ

Limit of EN55011-B,EN55032-B are same as its VCCI class B.

上記は、尖頭値検波(PK)方式にて測定した波形です。

The above is wave measured by the peak detection mode.

## 2.20 EMI 特性

Electro-Magnetic Interference characteristics

Conditions  $V_{in}$  : 230VAC

$I_{out}$  : 100%

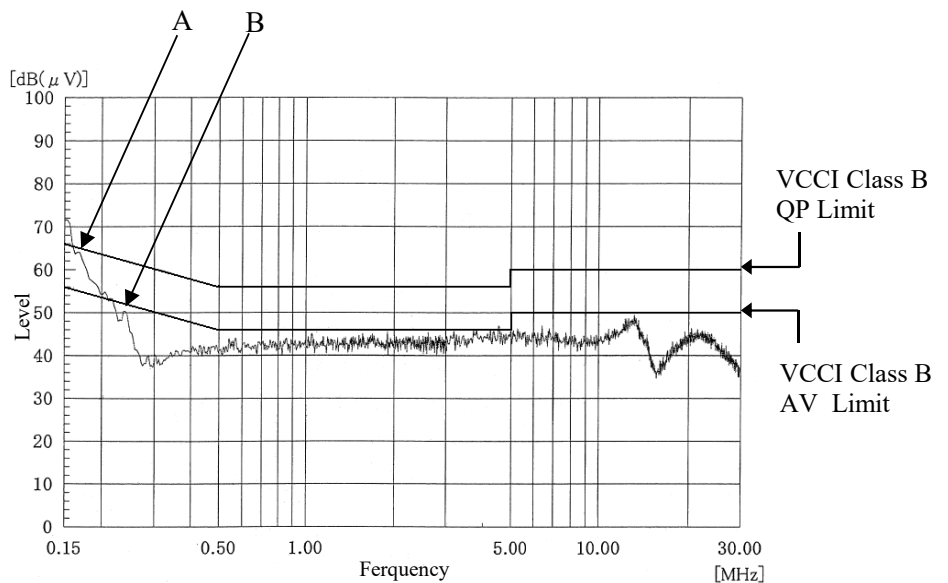
雑音端子電圧

Conducted Emission

60V

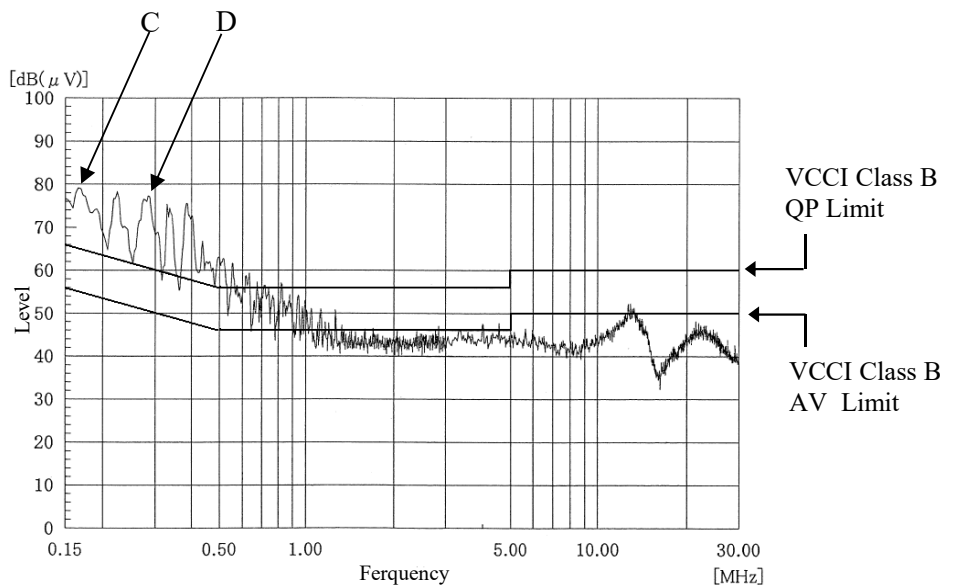
Point A (170kHz)		
Ref. Data	Limit (dB $\mu$ V)	Measure (dB $\mu$ V)
QP	65.0	57.7
AV	55.0	42.6

Point B (225kHz)		
Ref. Data	Limit (dB $\mu$ V)	Measure (dB $\mu$ V)
QP	62.6	44.1
AV	52.6	29.6



Phase : N

Point C (169kHz)		
Ref. Data	Limit (dB $\mu$ V)	Measure (dB $\mu$ V)
QP	65.0	60.1
AV	55.0	44.5



Phase : L

Point D (279kHz)		
Ref. Data	Limit (dB $\mu$ V)	Measure (dB $\mu$ V)
QP	60.8	35.4
AV	50.8	29.0

EN55011-B,EN55032-Bの限界値はVCCI class Bの限界値と同じ

Limit of EN55011-B,EN55032-B are same as its VCCI class B.

上記は、尖頭値検波(PK)方式にて測定した波形です。

The above is wave measured by the peak detection mode.

2.20 EMI 特性

Electro-Magnetic Interference characteristics

Conditions Vin : 100VAC

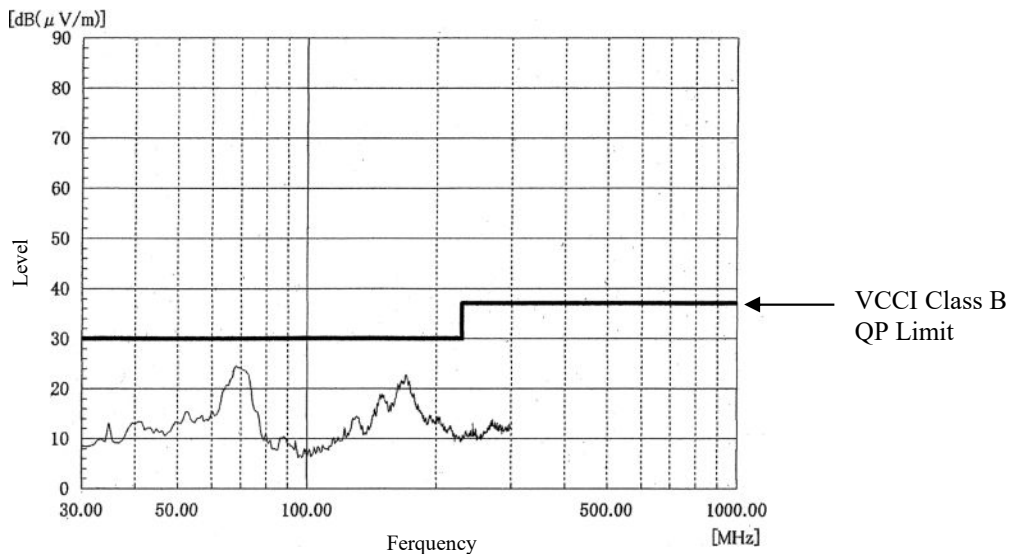
Iout : 100%

雑音電界強度

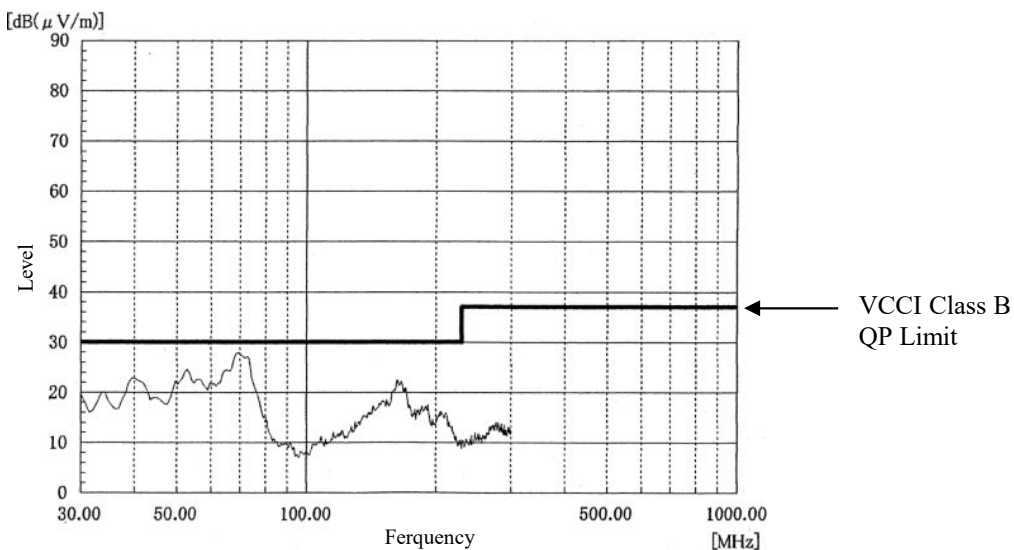
Radiated Emission

5V

HORIZONTAL



VERTICAL



EN55011-B,EN55032-Bの限界値はVCCI class Bの限界値と同じ  
Limit of EN55011-B,EN55032-B are same as its VCCI class B.

上記は、尖頭値検波(PK)方式にて測定した波形です。

The above is wave measured by the peak detection mode.

2.20 EMI 特性

Electro-Magnetic Interference characteristics

Conditions Vin : 100VAC

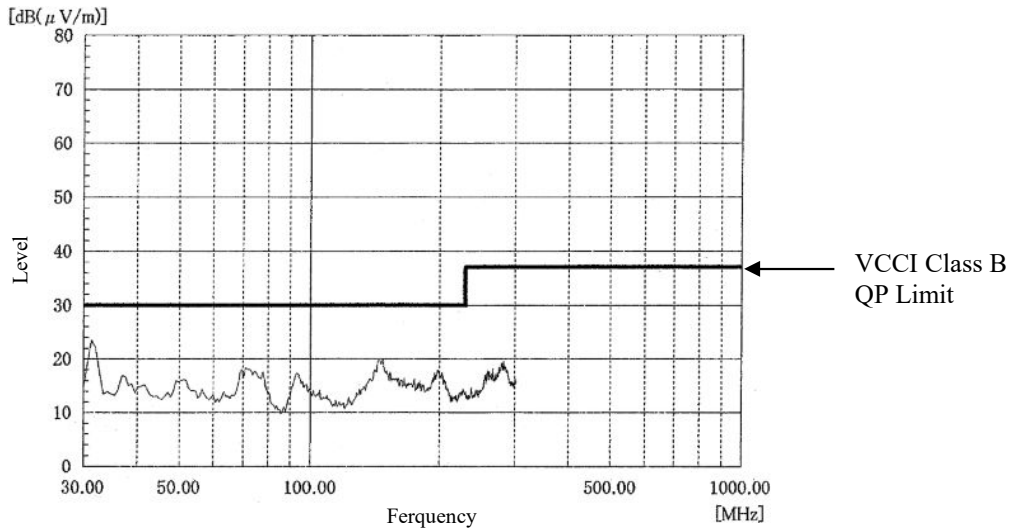
Iout : 100%

雑音電界強度

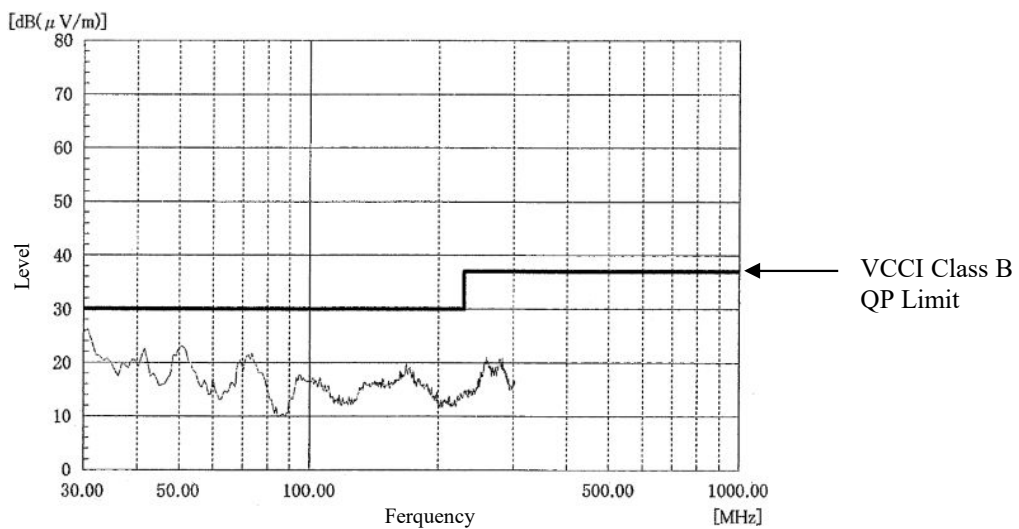
Radiated Emission

12V

HORIZONTAL



VERTICAL



EN55011-B,EN55032-Bの限界値はVCCI class Bの限界値と同じ  
Limit of EN55011-B,EN55032-B are same as its VCCI class B.

上記は、尖頭値検波(PK)方式にて測定した波形です。

The above is wave measured by the peak detection mode.

## 2.20 EMI 特性

Electro-Magnetic Interference characteristics

Conditions Vin : 100VAC

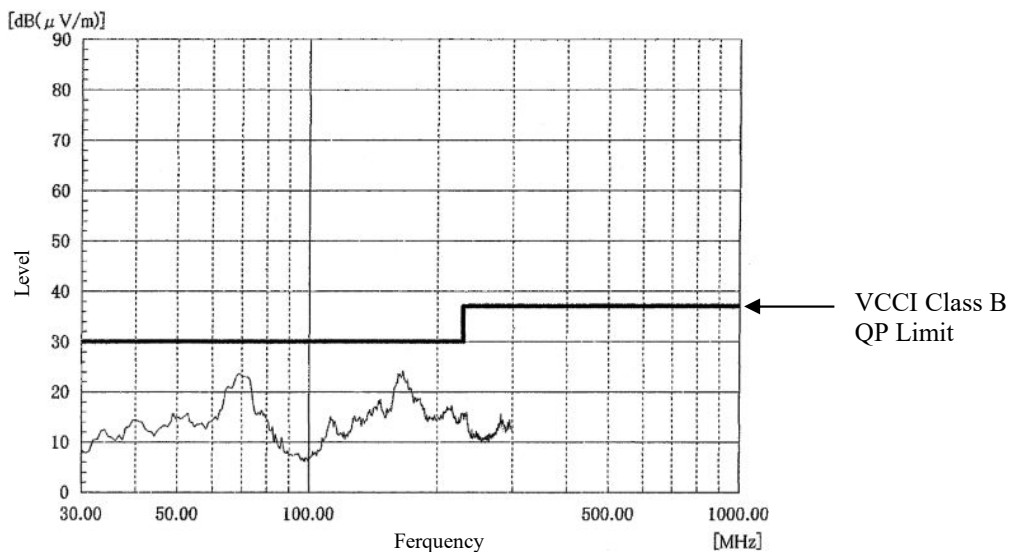
Iout : 100%

雑音電界強度

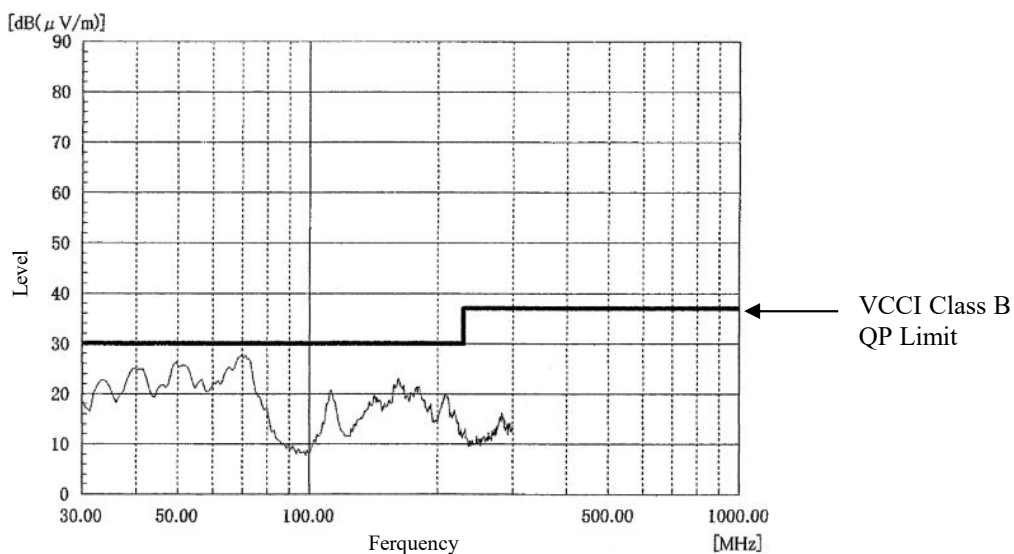
Radiated Emission

24V

HORIZONTAL



VERTICAL



EN55011-B,EN55032-Bの限界値はVCCI class Bの限界値と同じ  
Limit of EN55011-B,EN55032-B are same as its VCCI class B.

上記は、尖頭値検波(PK)方式にて測定した波形です。

The above is wave measured by the peak detection mode.



2.20 EMI 特性

Electro-Magnetic Interference characteristics

Conditions Vin : 100VAC

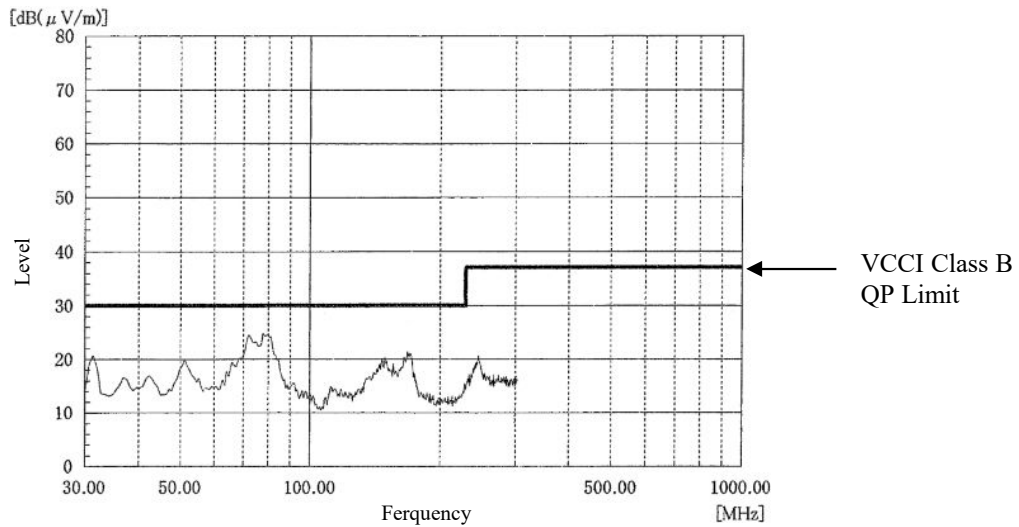
Iout : 100%

雑音電界強度

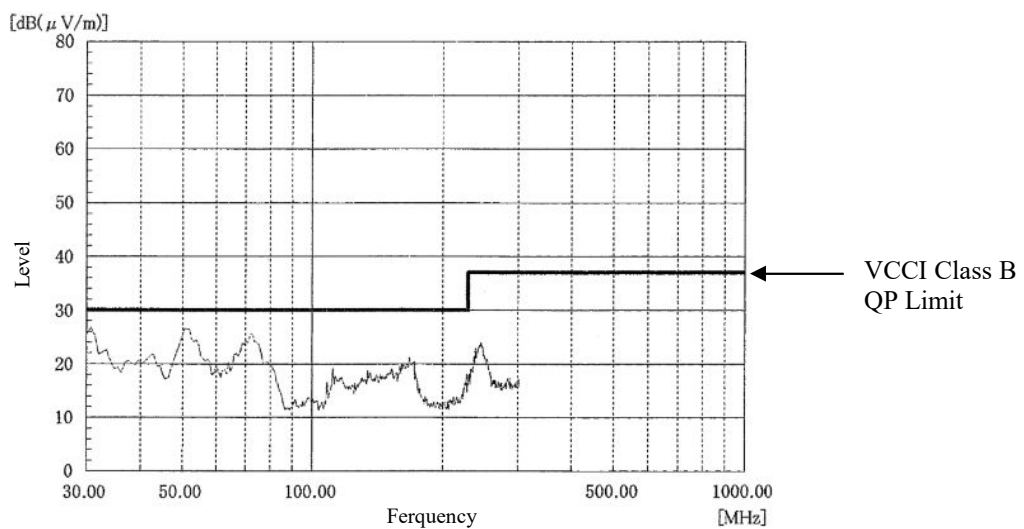
Radiated Emission

60V

HORIZONTAL



VERTICAL



EN55011-B,EN55032-Bの限界値はVCCI class Bの限界値と同じ  
Limit of EN55011-B,EN55032-B are same as its VCCI class B.

上記は、尖頭値検波(PK)方式にて測定した波形です。

The above is wave measured by the peak detection mode.