

ZWS100BAF

EVALUATION DATA

型式データ

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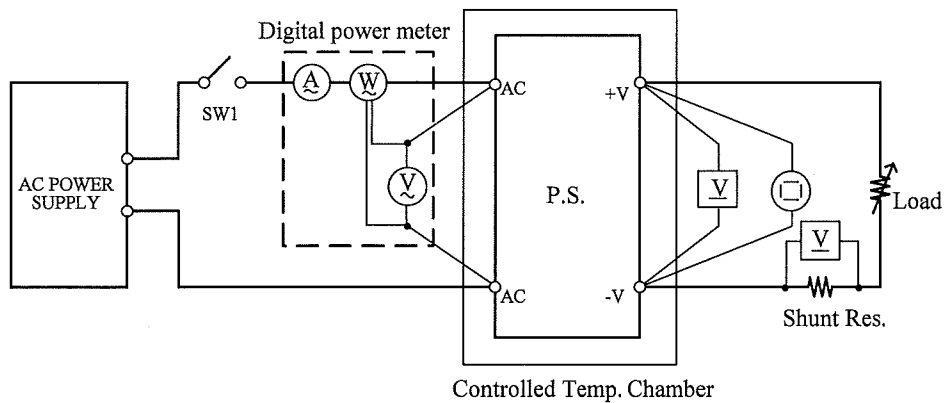
使用記号 Terminology used

	定義	Definition
V_{in} 入力電圧	Input voltage
V_{out} 出力電圧	Output voltage
I_{in} 入力電流	Input current
I_{out} 出力電流	Output current
T_a 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

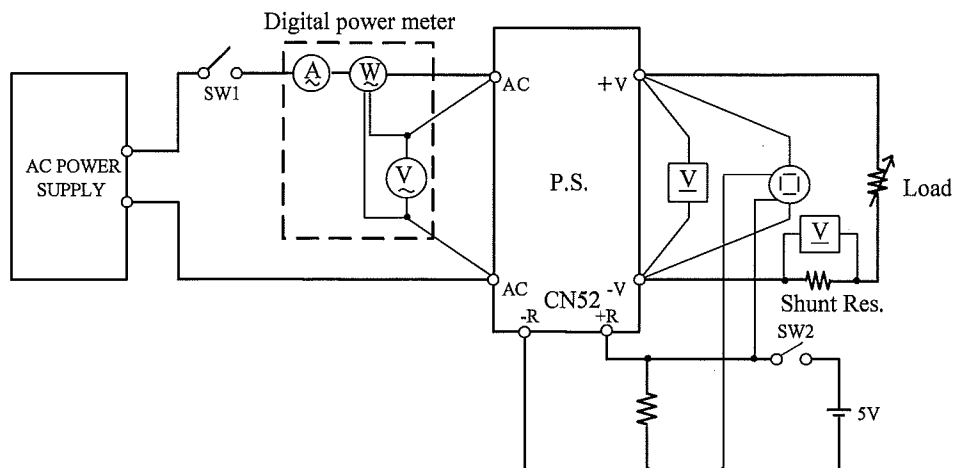
測定回路1 Circuit 1 used for determination

- 静特性 Steady state data
- 過電流保護特性 Over current protection (OCP) characteristics
- 過電圧保護特性 Over voltage protection (OVP) characteristics
- 出力立ち上がり特性 Output rise characteristics
- 出力立ち下がり特性 Output fall characteristics
- 出力保持時間特性 Hold up time characteristics



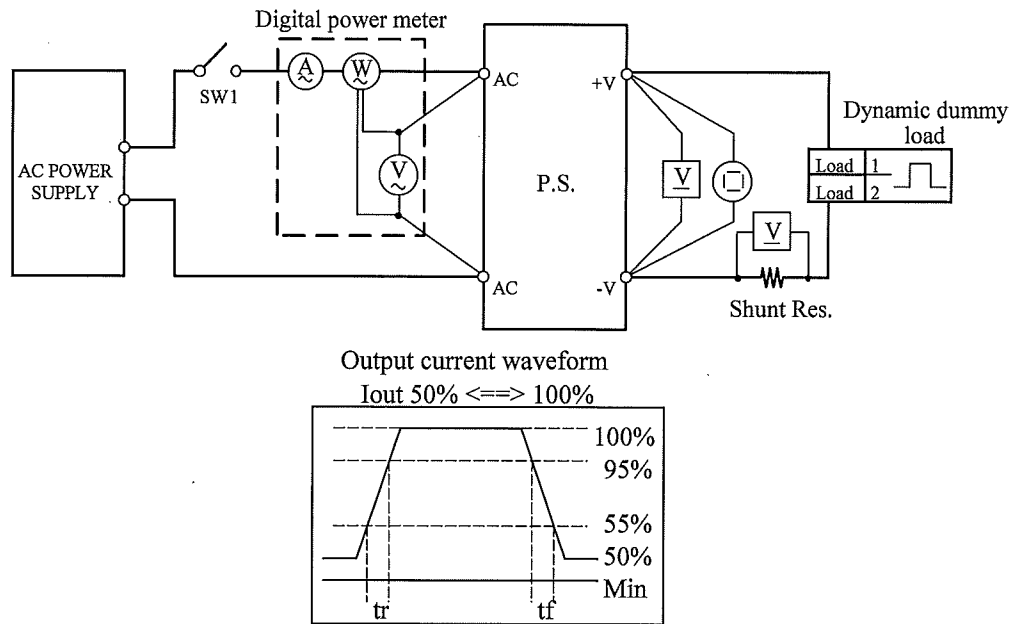
測定回路2 Circuit 2 used for determination

- ON/OFFコントロール時出力立ち上がり、立ち下がり特性
 Output rise, fall characteristics with ON/OFF Control
- 準標準品 ZWS150BAF-*/R にて対応
 For alternative standard model ZWS150BAF-*/R



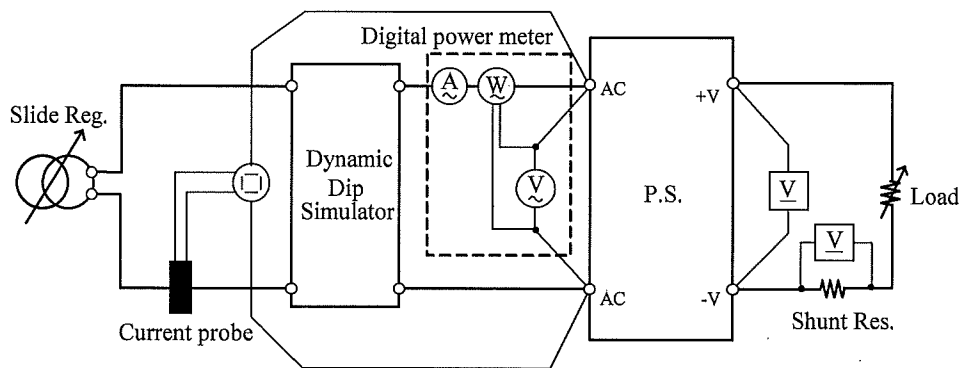
測定回路3 Circuit 3 used for determination

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



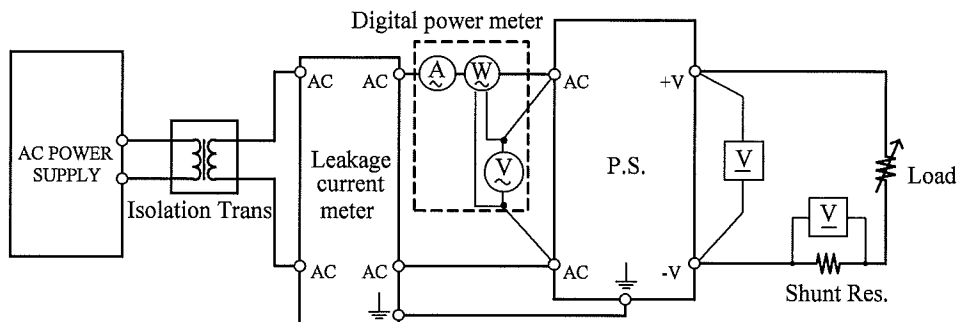
測定回路4 Circuit 4 used for determination

・入力サージ電流 (突入電流) 波形 Inrush current waveform



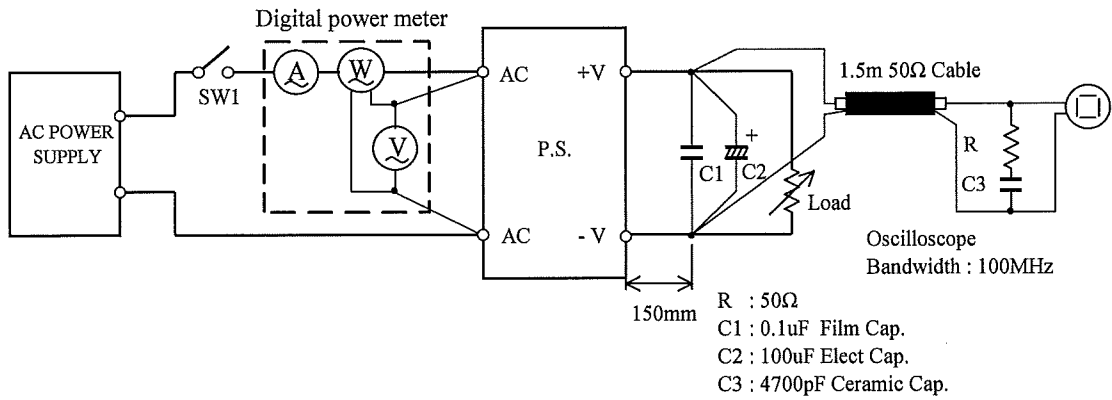
測定回路5 Circuit 5 used for determination

・リーク電流特性 Leakage current characteristics



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

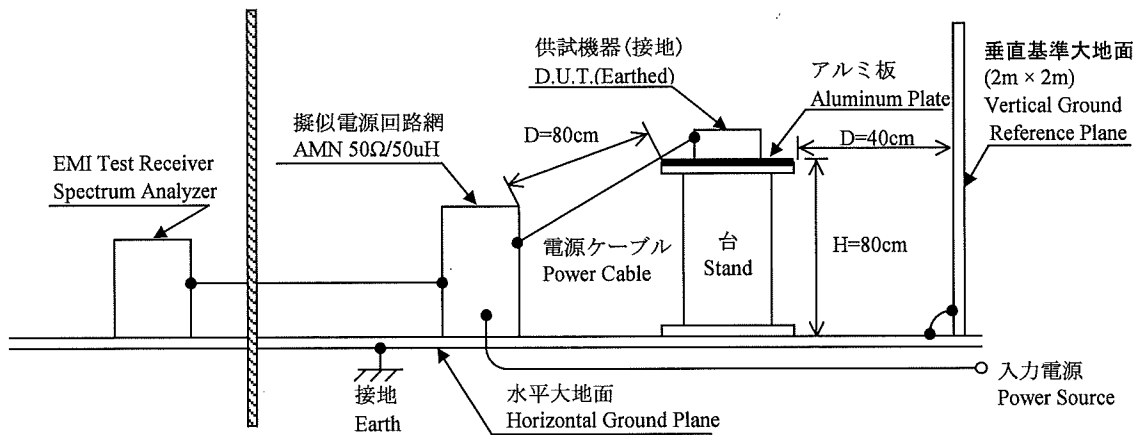


測定構成 Configuration used for determination

・EMI特性 Electro-Magnetic Interference characteristics

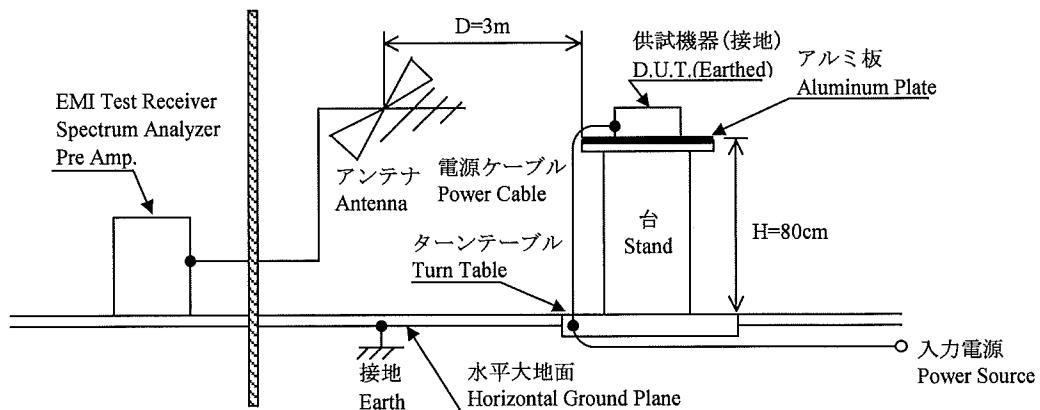
(a) 雑音端子電圧 (帰還ノイズ)

Conducted Emission



(b) 雑音電界強度 (放射ノイズ)

Radiated Emission



1.2 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	TEKTRONIX	TDS3012
2	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DL9040L
3	DIGITAL MULTIMETER	AGILENT	34970A
4	DIGITAL POWER METER	YOKOGAWA ELECT.	WT210
5	CURRENT PROBE	YOKOGAWA ELECT.	701928 / 701930
6	DYNAMIC DUMMY LOAD	TAKASAGO	FK-200L / FK-400L
7	DUMMY LOAD	PCN	RHF250 SIRIES
8	SLIDE REGULATOR	MATSUNAGA	S3-24100
9	CVCF	TAKASAGO	AA2000XG
10	CVCF	NF	ES10000S
11	LEAKAGE CURRENT METER	HIOKI	3156
12	DYNAMIC DIP SIMULATOR	TAKAMISAWA	PSA-210
13	CONTROLLED TEMP. CHAMBER	ESPEC	SU-641 / SH-241
14	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESCI
15	PRE AMP.	SONOMA	310N
16	AMN	SCHWARZBECK	NNLK8121
17	ANTENNA	SCHWARZBECK	CBL6111D
18	HARMONIC / FLICKER ANALYZER	KIKUSUI	KHA1000
19	SINGLE-PHASE MASTER	NF	4420
20	REFERENCE IMPEDANCE NETWORK 20A	NF	4150
21	MULTI OUTLET UNIT	KIKUSUI	OT01-KHA

2.1 静特性 Steady state data

(1) 入力・負荷・温度変動／出力起動・遮断電圧

Regulation - line and load, Temperature drift / Start up voltage and Drop out voltage

5V	1. Regulation - line and load					Condition Ta : 25 °C	
	Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
	0%	5.006V	5.006V	5.006V	5.007V	1mV	0.020%
	50%	5.002V	5.002V	5.002V	5.003V	1mV	0.020%
	100%	4.999V	4.999V	4.999V	4.999V	0mV	0.000%
	load	7mV	7mV	7mV	8mV		
	regulation	0.140%	0.140%	0.140%	0.160%		
	2. Temperature drift					Conditions Vin : 100 VAC Iout : 100 %	
	Ta	-10°C	+25°C	+50°C	temperature stability		
	Vout	5.000V	4.999V	4.979V	21mV	0.420%	
	3. Start up voltage and Drop out voltage					Conditions Ta : 25 °C Iout : 100 %	
	Start up voltage (Vin)	76VAC					
	Drop out voltage (Vin)	63VAC					

12V	1. Regulation - line and load					Condition Ta : 25 °C	
	Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
	0%	12.018V	12.019V	12.019V	12.019V	1mV	0.008%
	50%	12.015V	12.016V	12.016V	12.016V	1mV	0.008%
	100%	12.013V	12.013V	12.013V	12.013V	0mV	0.000%
	load	5mV	6mV	6mV	6mV		
	regulation	0.042%	0.050%	0.050%	0.050%		
	2. Temperature drift					Conditions Vin : 100 VAC Iout : 100 %	
	Ta	-10°C	+25°C	+50°C	temperature stability		
	Vout	12.011V	12.013V	12.013V	2mV	0.017%	
	3. Start up voltage and Drop out voltage					Conditions Ta : 25 °C Iout : 100 %	
	Start up voltage (Vin)	75VAC					
	Drop out voltage (Vin)	65VAC					

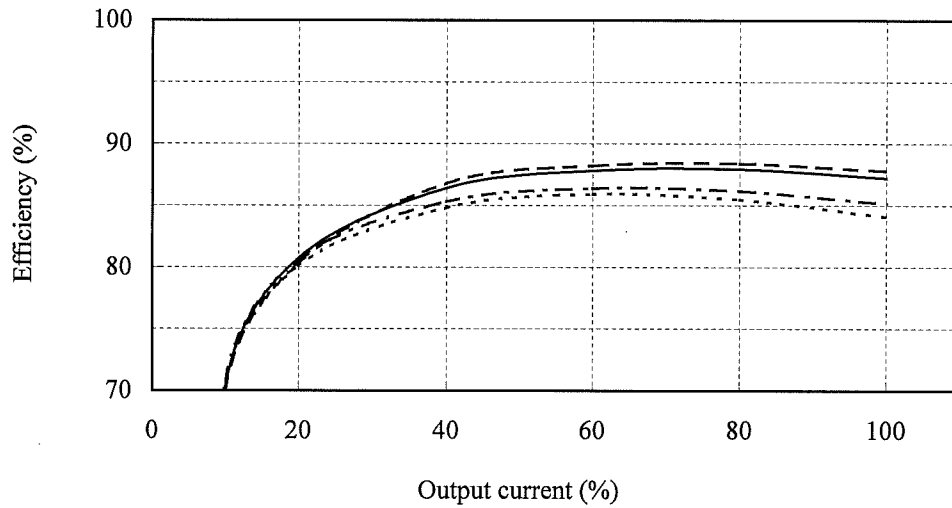
24V	1. Regulation - line and load					Condition Ta : 25 °C	
	Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
	0%	24.036V	24.037V	24.037V	24.037V	1mV	0.004%
	50%	24.034V	24.034V	24.034V	24.034V	0mV	0.000%
	100%	24.035V	24.035V	24.035V	24.035V	0mV	0.000%
	load	2mV	3mV	3mV	3mV		
	regulation	0.008%	0.013%	0.013%	0.013%		
	2. Temperature drift					Conditions Vin : 100 VAC Iout : 100 %	
	Ta	-10°C	+25°C	+50°C	temperature stability		
	Vout	24.049V	24.035V	24.020V	29mV	0.121%	
	3. Start up voltage and Drop out voltage					Conditions Ta : 25 °C Iout : 100 %	
	Start up voltage (Vin)	75VAC					
	Drop out voltage (Vin)	65VAC					

(2) 効率対出力電流

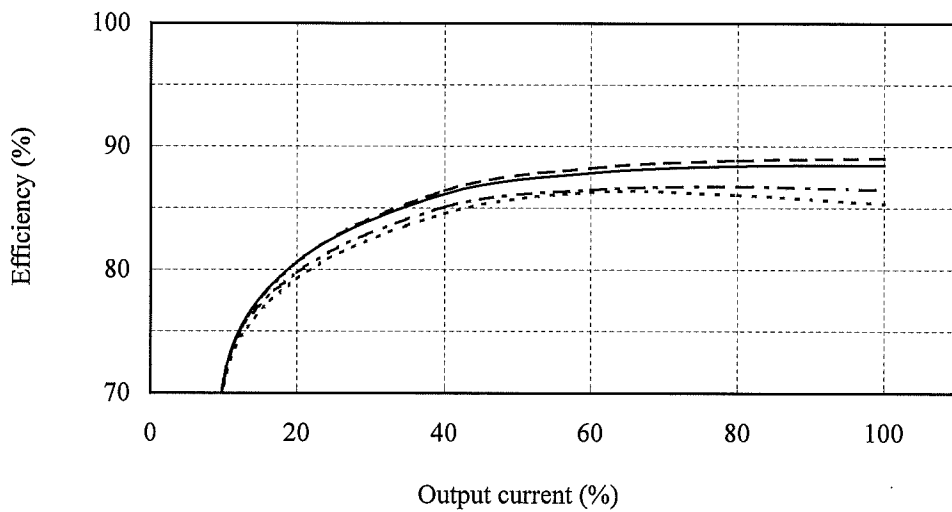
Efficiency vs. Output current

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

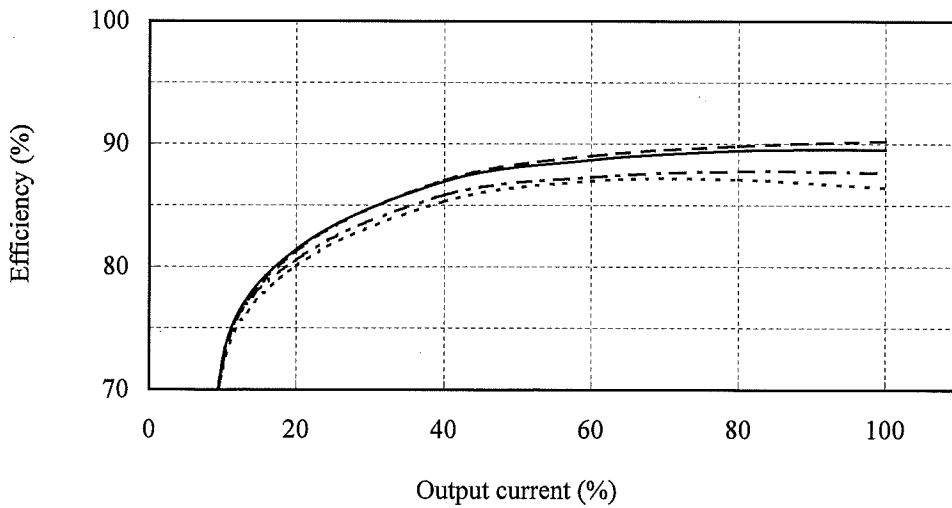
5V



12V



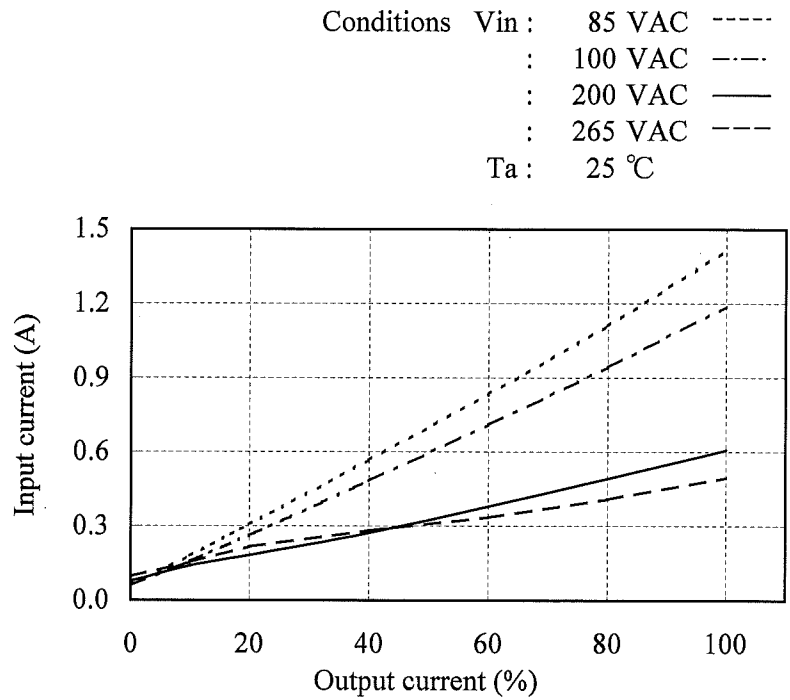
24V



(3) 入力電流対出力電流
Input current vs. Output current

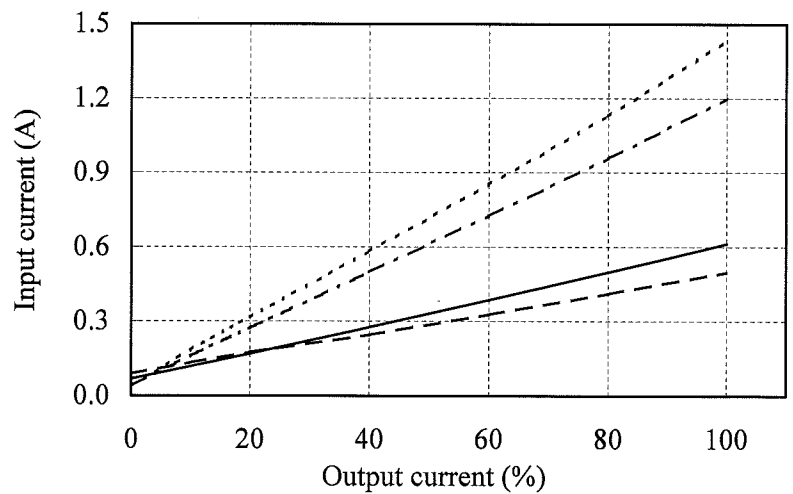
5V

Vin	Input current	
	Iout : 0%	Control OFF*
85VAC	0.06A	0.04A
100VAC	0.06A	0.04A
200VAC	0.08A	0.07A
265VAC	0.10A	0.09A



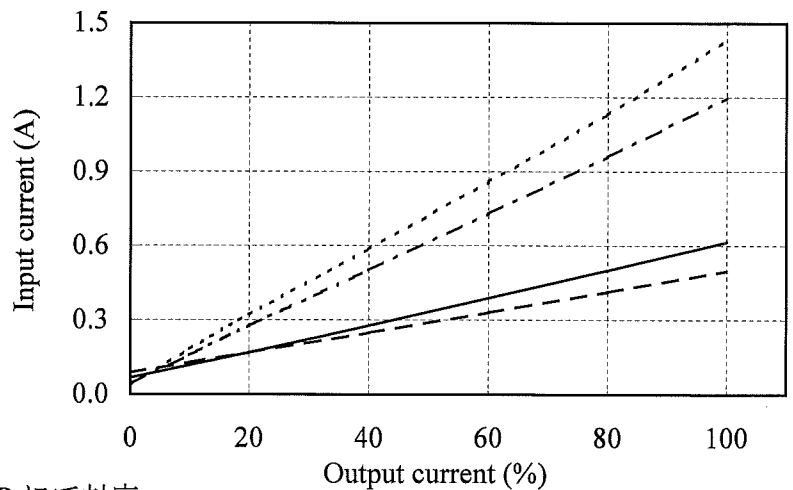
12V

Vin	Input current	
	Iout : 0%	Control OFF*
85VAC	0.04A	0.03A
100VAC	0.04A	0.04A
200VAC	0.07A	0.07A
265VAC	0.09A	0.09A



24V

Vin	Input current	
	Iout : 0%	Control OFF*
85VAC	0.04A	0.03A
100VAC	0.04A	0.04A
200VAC	0.07A	0.07A
265VAC	0.09A	0.09A



* 準標準品 ZWS100BAF-*/R にて対応
For alternative standard model ZWS100BAF-*/R

ZWS100BAF

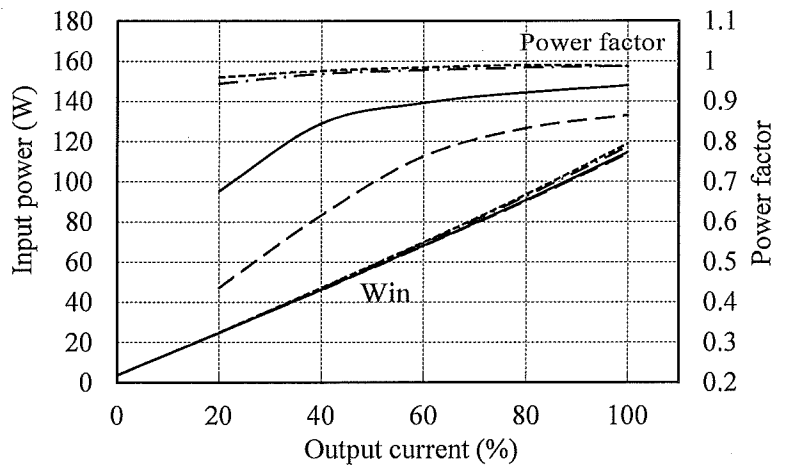
(4) 入力電力・力率対出力電流

Input power and Power factor vs. Output current

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

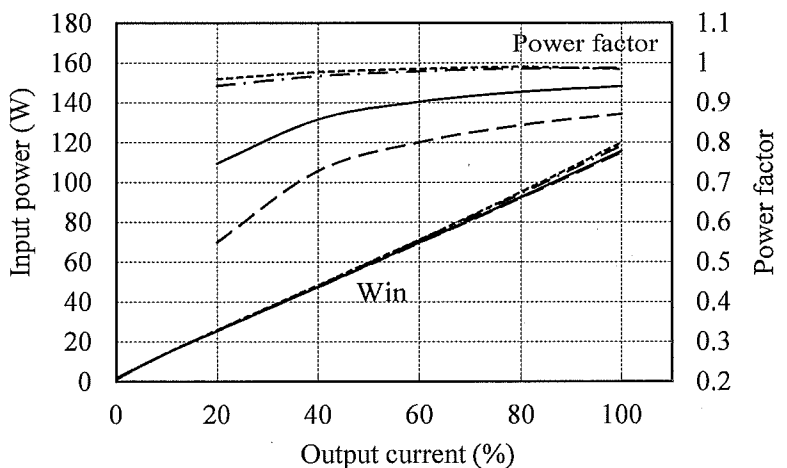
5V

Vin	Input power	
	Iout : 0%	Control OFF*
85VAC	3.8W	0.8W
100VAC	3.7W	1.0W
200VAC	3.8W	1.7W
265VAC	3.8W	1.7W



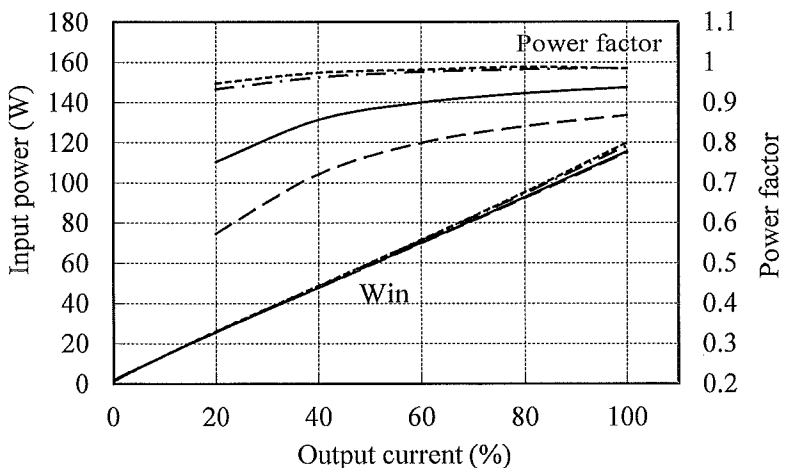
12V

Vin	Input power	
	Iout : 0%	Control OFF*
85VAC	1.3W	0.9W
100VAC	1.3W	1.2W
200VAC	1.9W	1.7W
265VAC	2.0W	1.7W



24V

Vin	Input power	
	Iout : 0%	Control OFF*
85VAC	1.4W	0.9W
100VAC	1.5W	1.2W
200VAC	2.1W	1.9W
265VAC	2.1W	1.9W



* 準標準品 ZWS100BAF-*/R にて対応

For alternative standard model ZWS100BAF-*/R

2.2 過電流保護特性

Over current protection (OCP) characteristics

2.3 過電圧保護特性

Over voltage protection (OVP) characteristics

Conditions V_{in} : 100 VAC

T_a : -10 °C

25 °C

50 °C

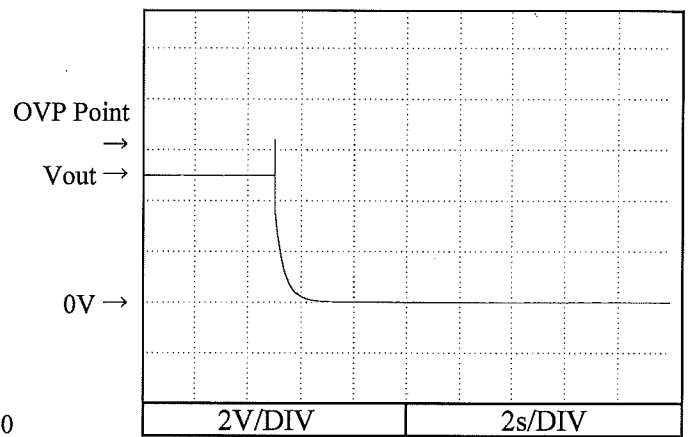
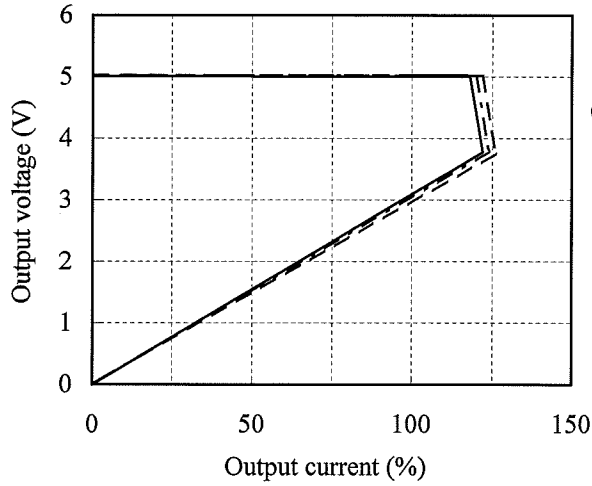
- - - -

Conditions V_{in} : 100 VAC

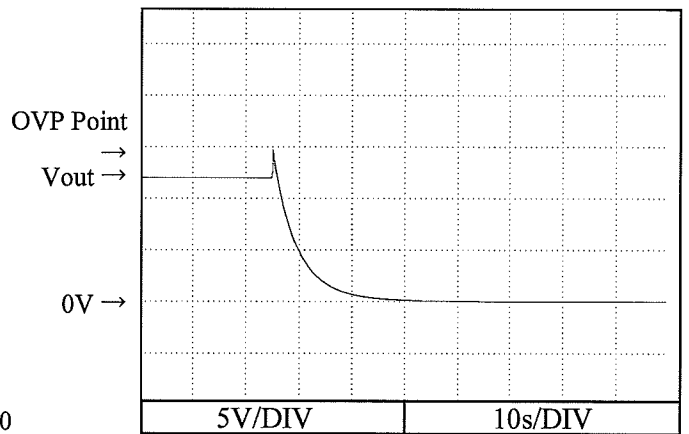
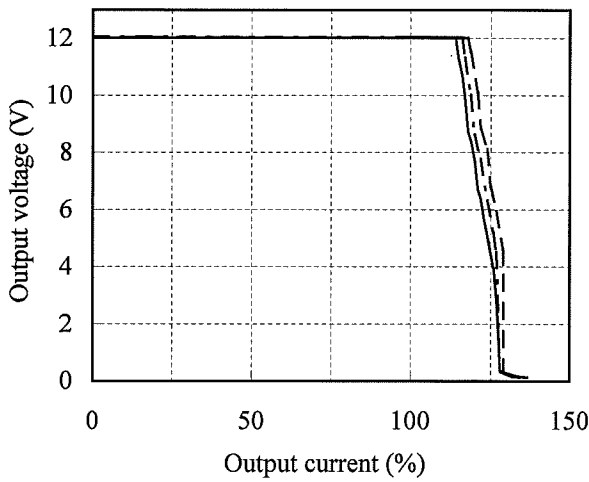
I_{out} : 0 %

T_a : 25 °C

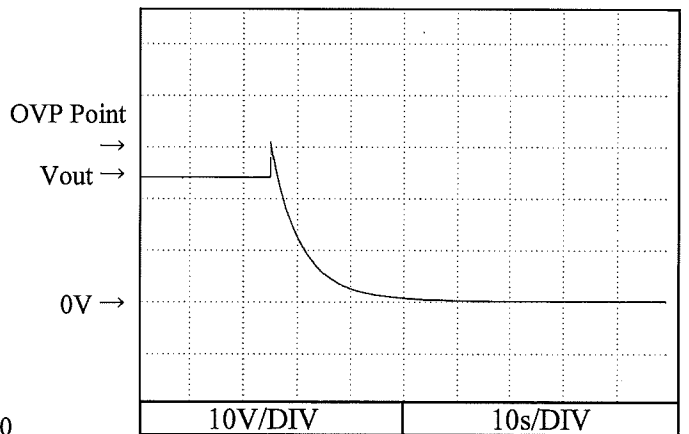
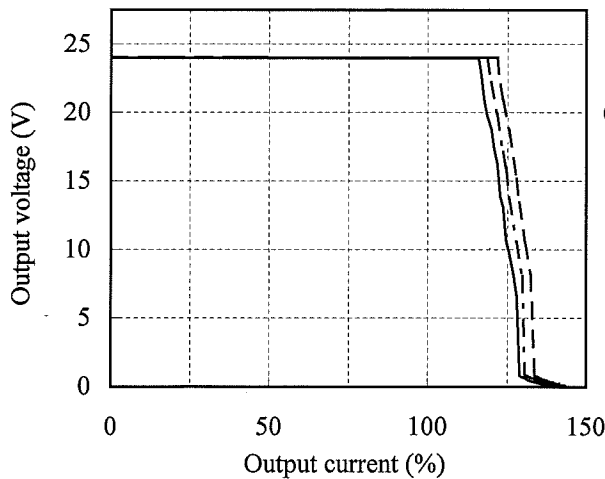
5V



12V



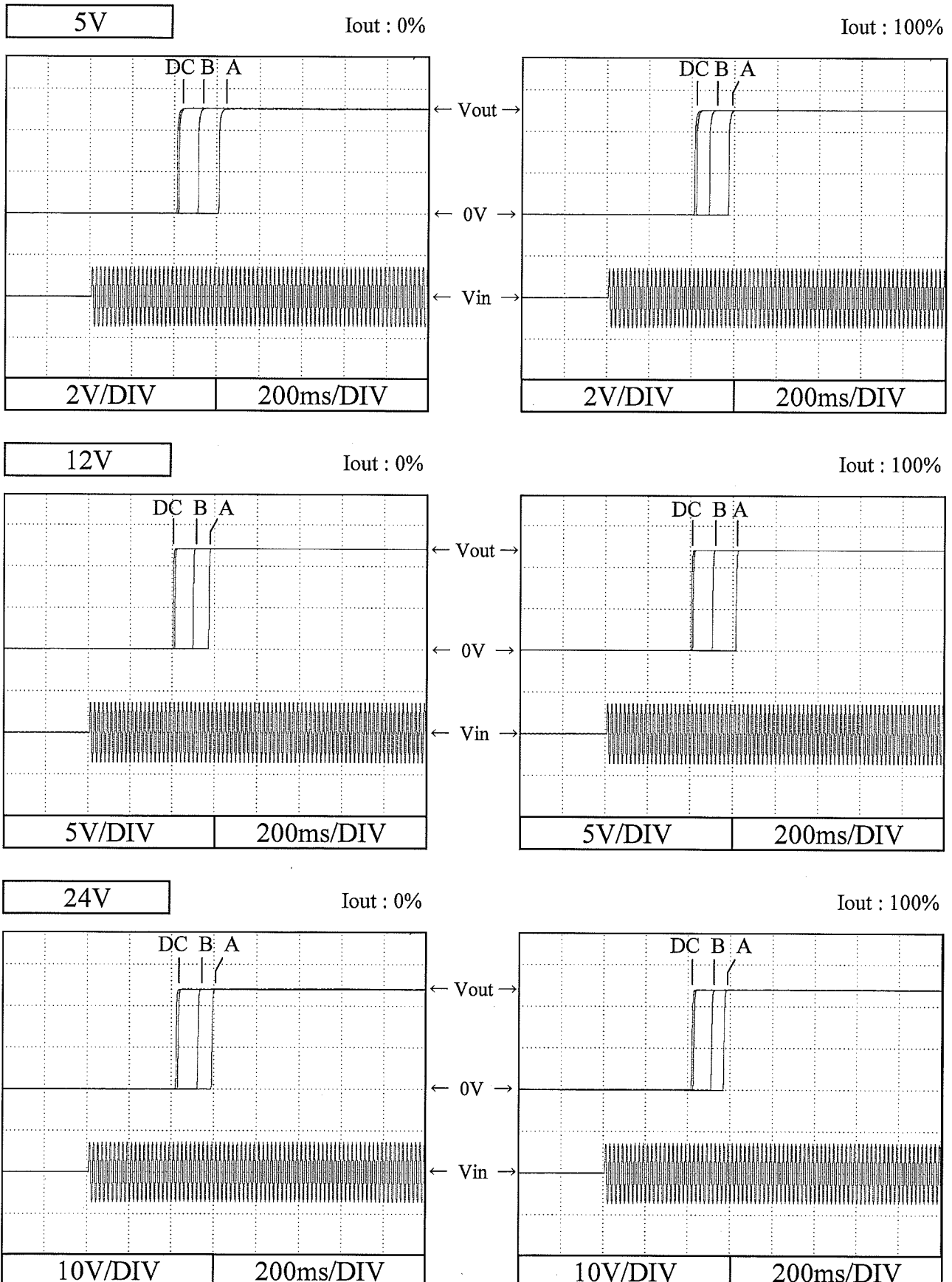
24V



2.4 出力立ち上がり特性

Output rise characteristics

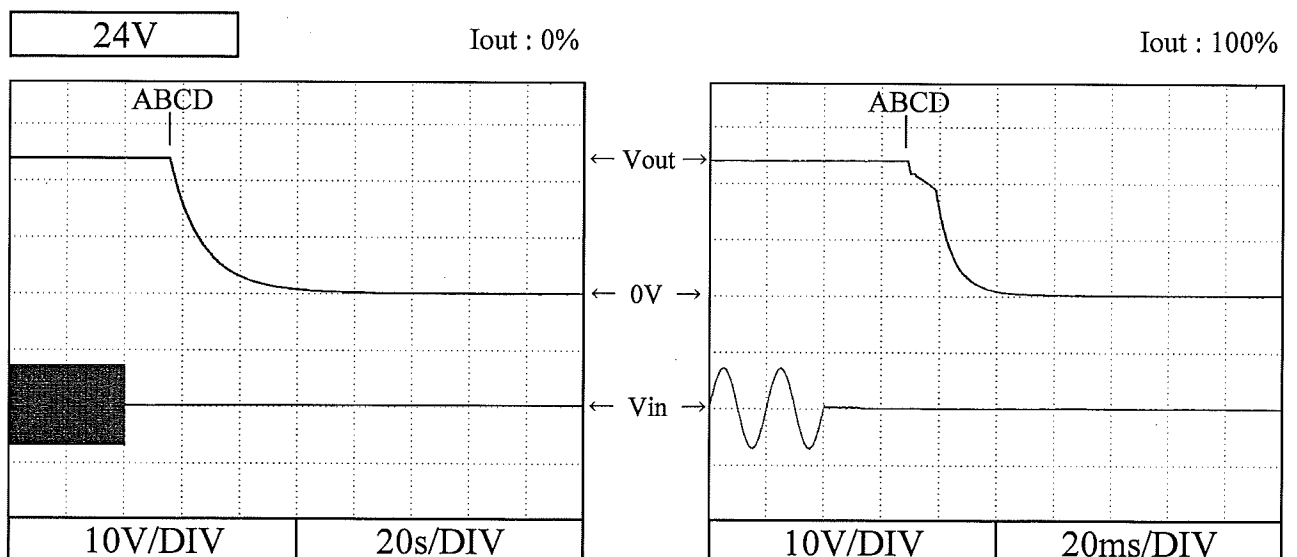
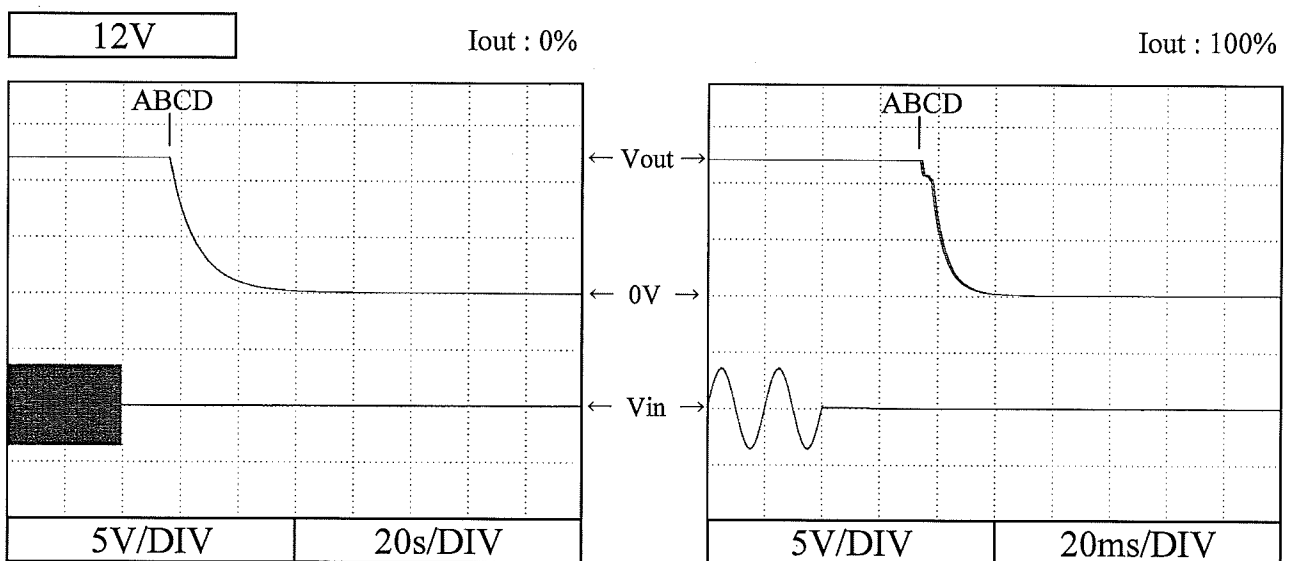
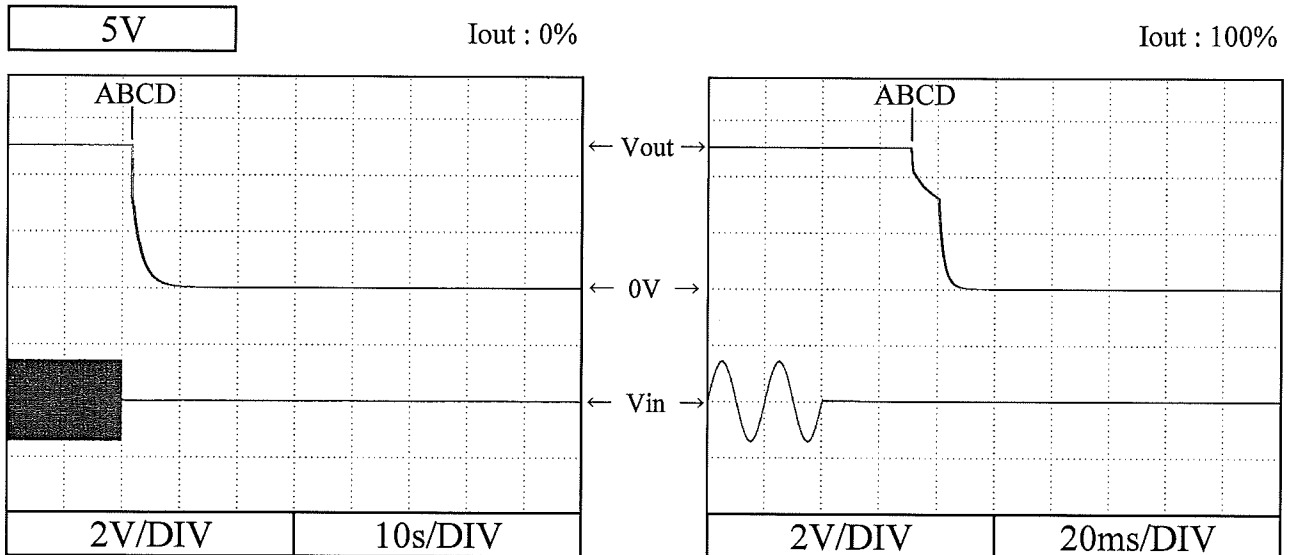
Conditions Vin : 85 VAC (A)
 100 VAC (B)
 200 VAC (C)
 265 VAC (D)
 Ta : 25 °C



2.5 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)
 Ta : 25 °C

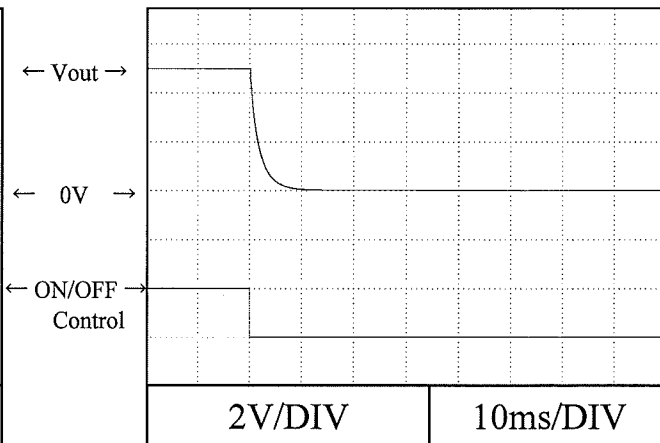
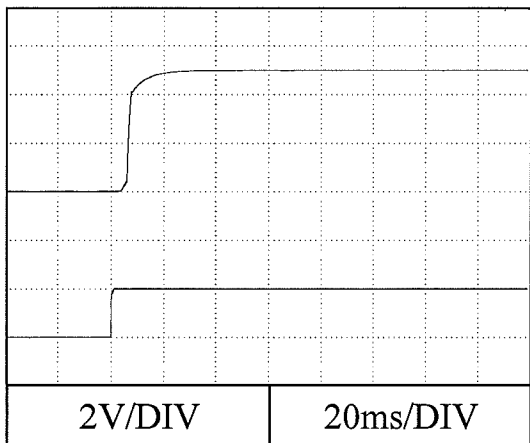


2.6 ON/OFFコントロール時出力立ち上がり、立ち下り特性 Output rise, fall characteristics with ON/OFF Control

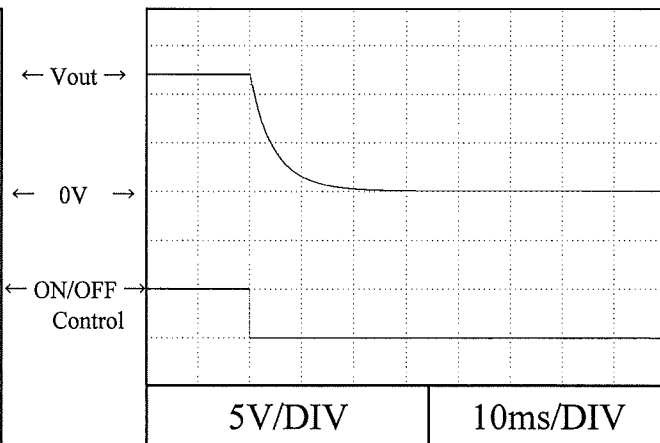
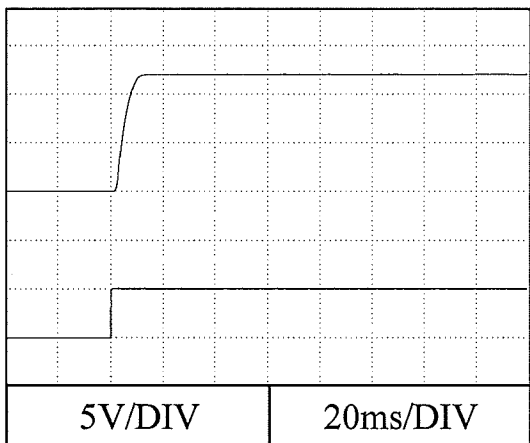
Conditions V_{in} : 100 VAC
 I_{out} : 100 %
 T_a : 25 °C

準標準品 ZWS100BAF-*/R に対応
 For alternative standard model ZWS100BAF-*/R

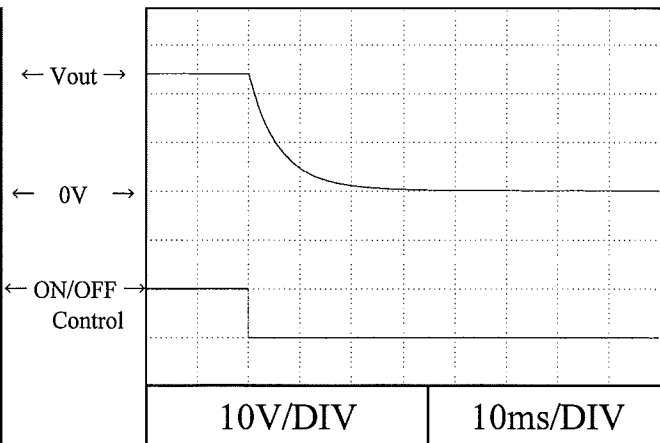
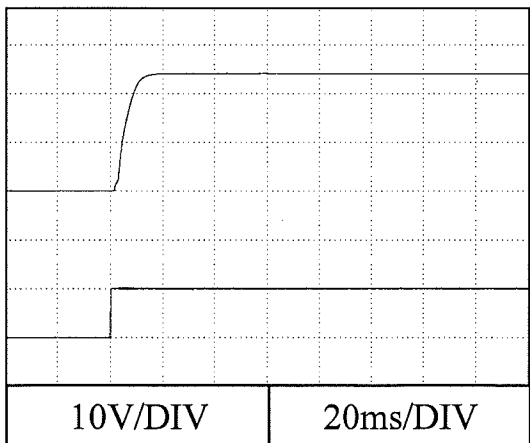
5V



12V



24V

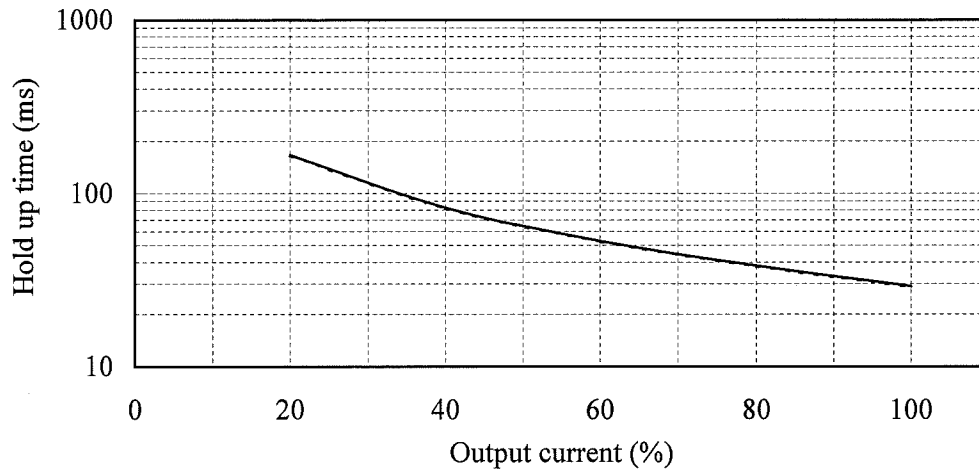


2.7 出力保持時間特性

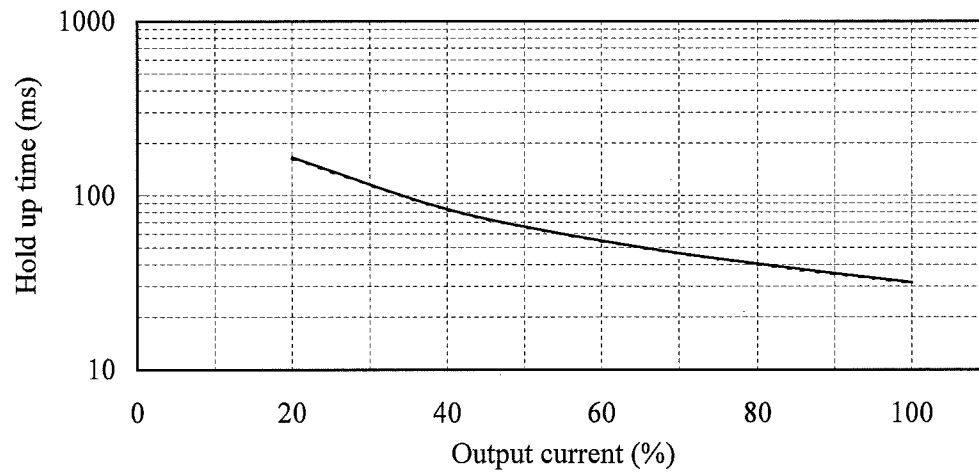
Hold up time characteristics

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

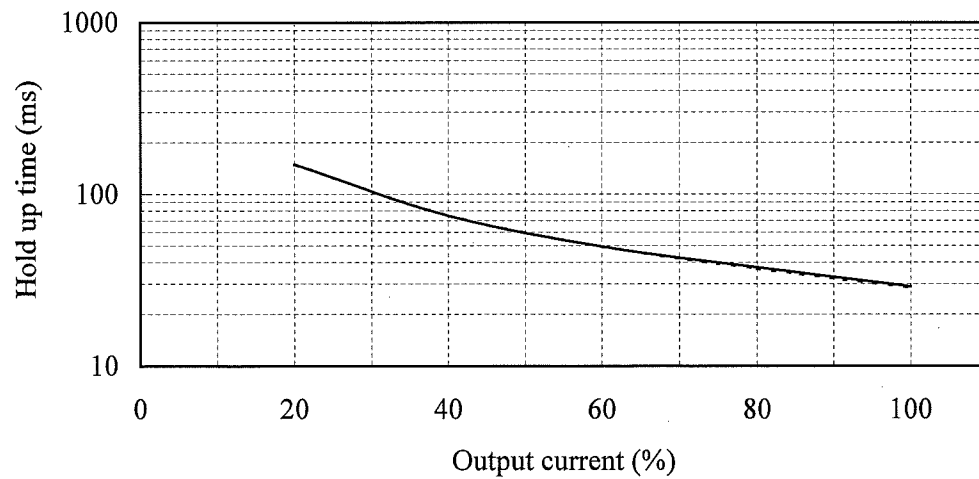
5V



12V



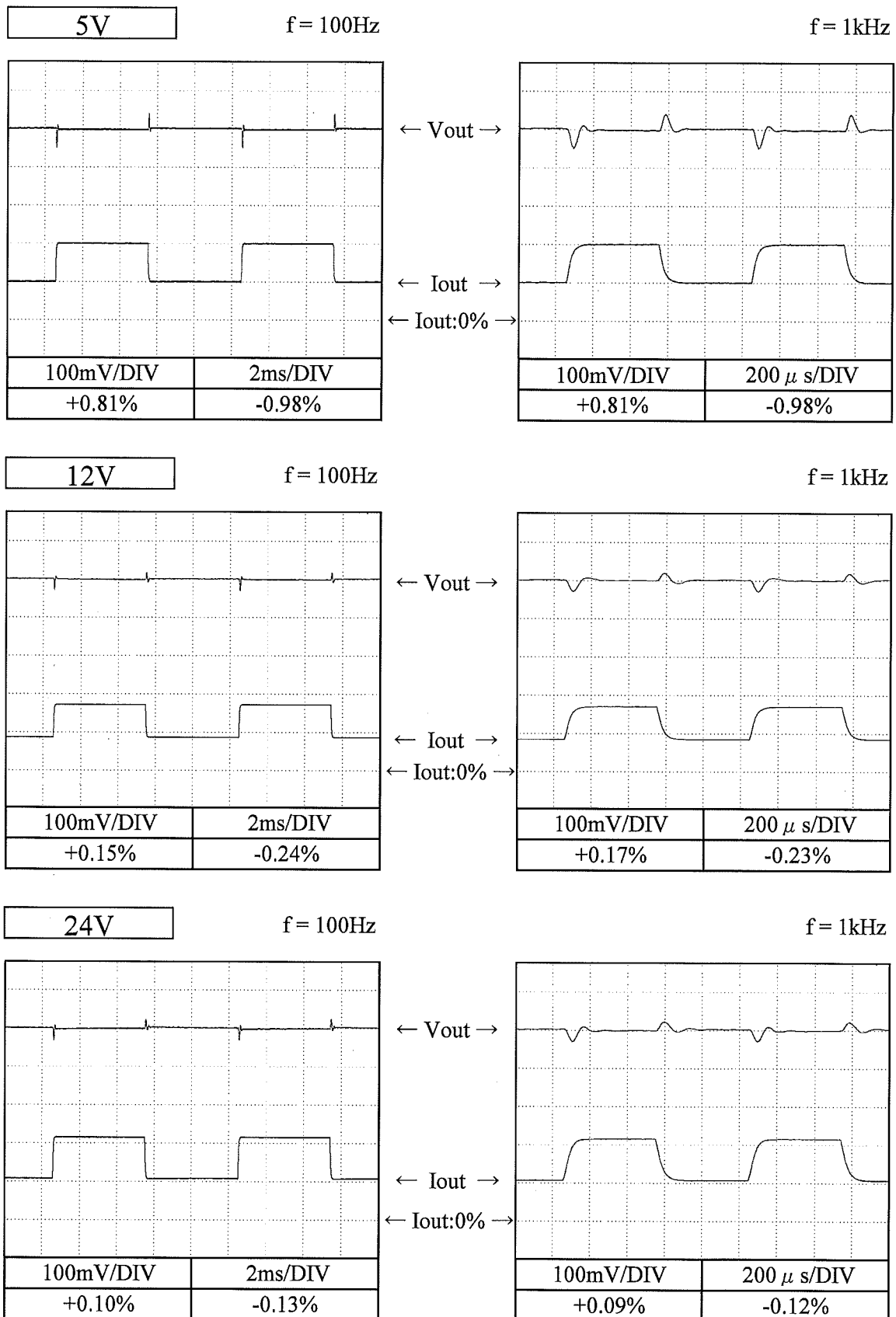
24V



2.8 過渡応答 (負荷急変) 特性

Dynamic load response characteristics

Conditions V_{in} : 100 VAC
 I_{out} : 50 % \leftrightarrow 100 %
 (tr = tf = 50us)
 T_a : 25 °C



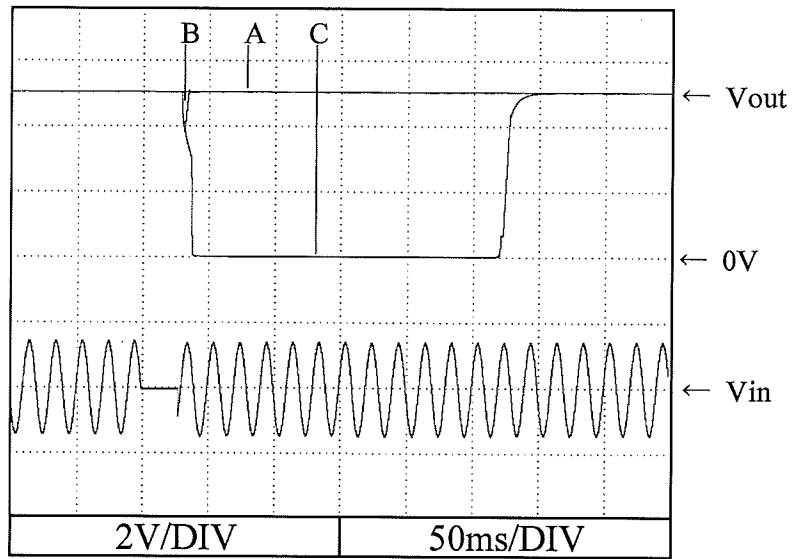
2.9 入力電圧瞬停特性

Response to brown out characteristics

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

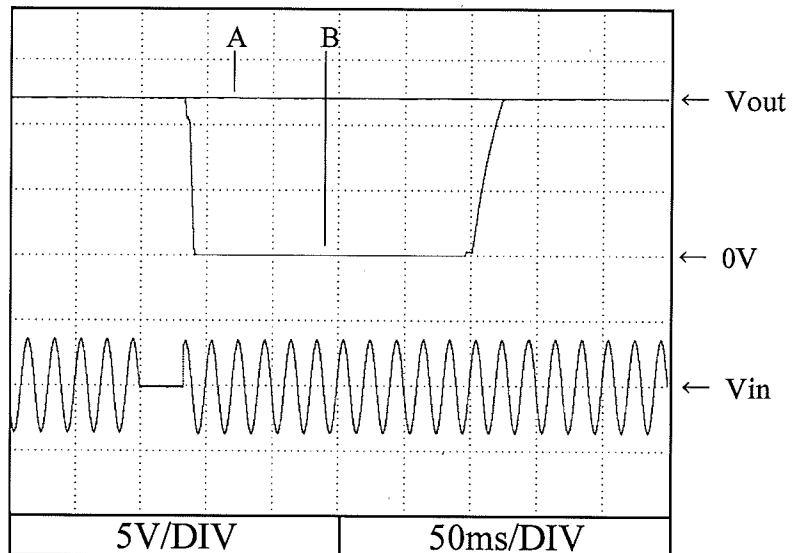
5V

A = 28ms
B = 32ms
C = 35ms



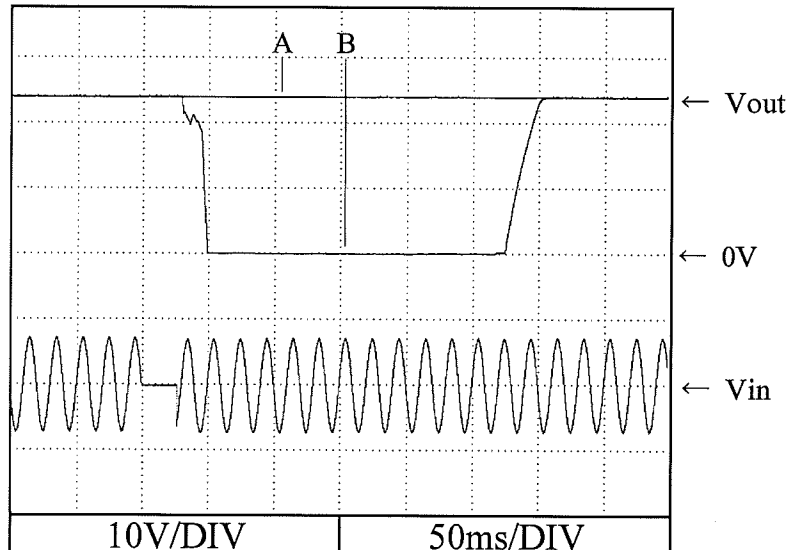
12V

A = 33ms
B = 36ms



24V

A = 27ms
B = 36ms



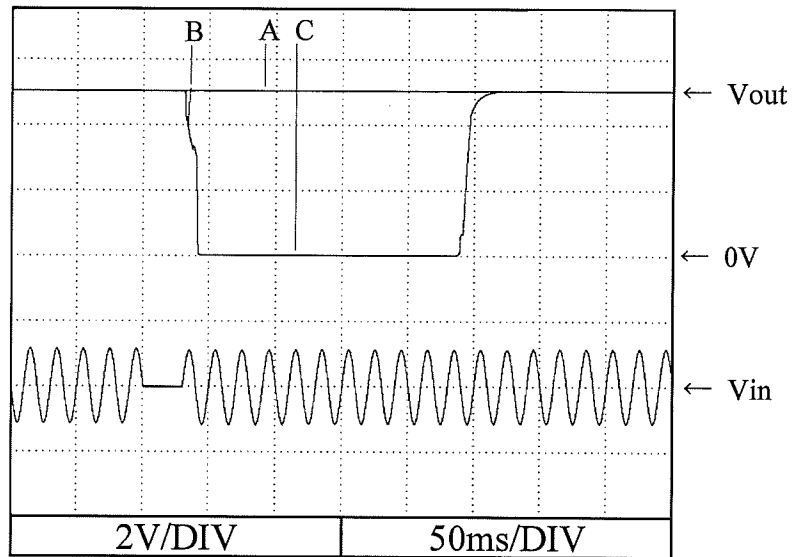
2.9 入力電圧瞬停特性

Response to brown out characteristics

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

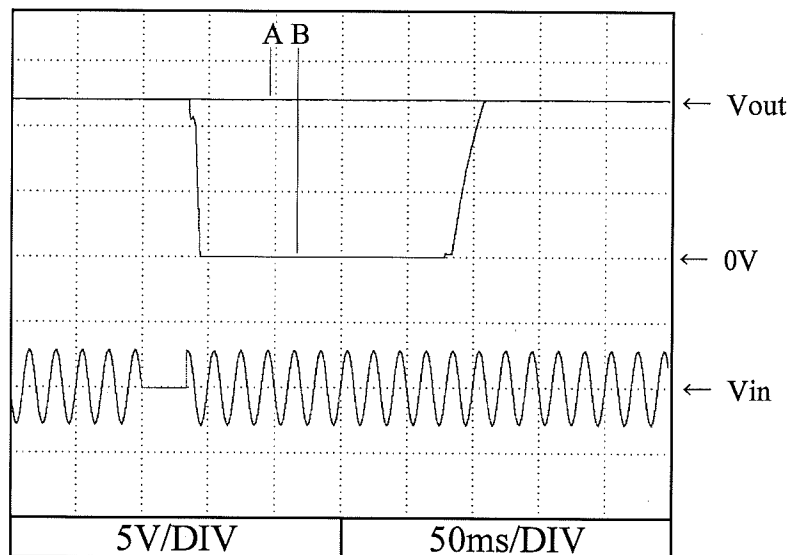
5V

A = 29ms
B = 32ms
C = 37ms



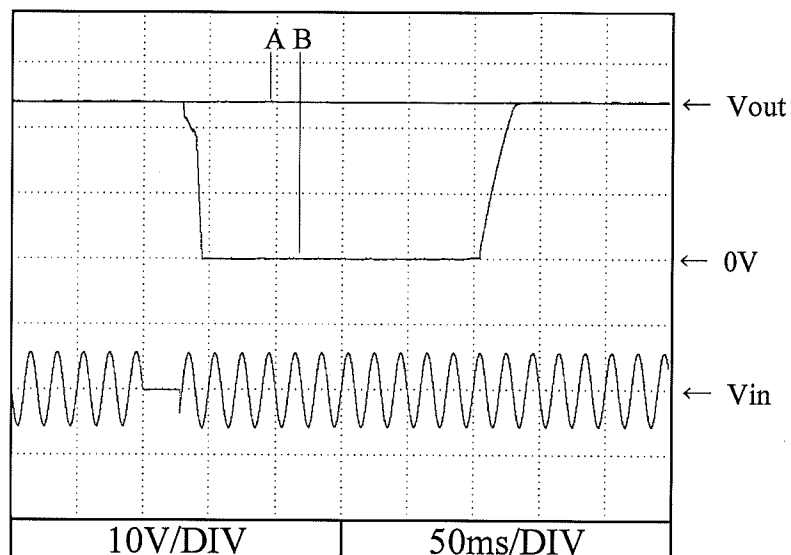
12V

A = 34ms
B = 37ms



24V

A = 28ms
B = 37ms

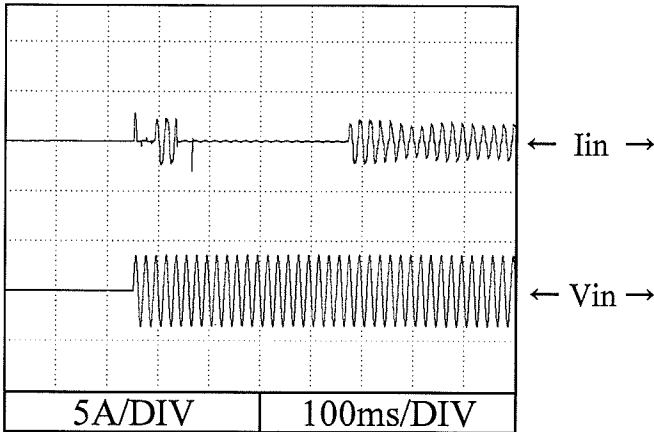


2.10 入力サージ電流 (突入電流) 波形
Inrush current waveform

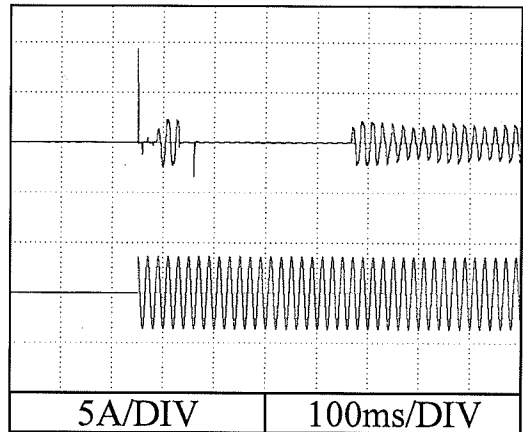
5V

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

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

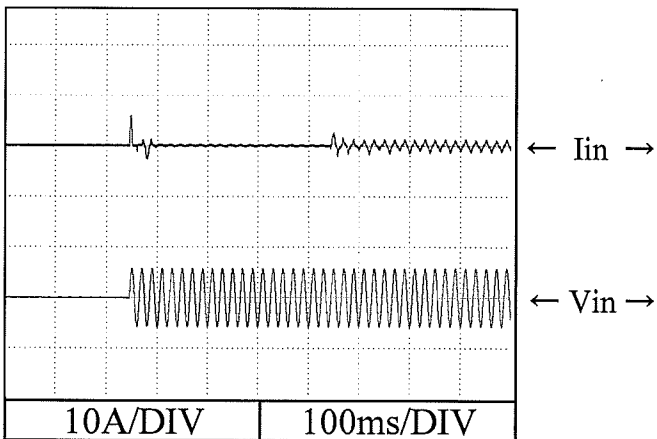


Switch on phase angle of input AC voltage
 $\phi = 90^\circ$

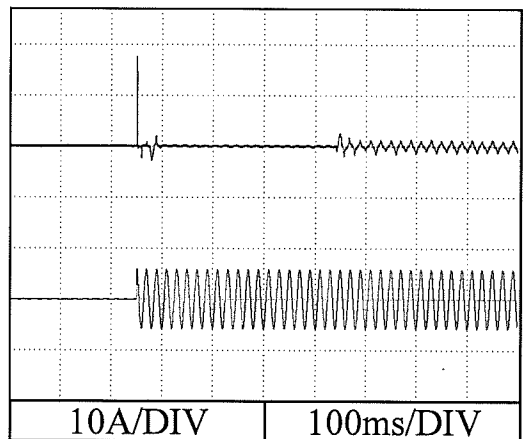


Conditions Vin : 200 VAC
Iout : 100 %
Ta : 25 °C

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



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



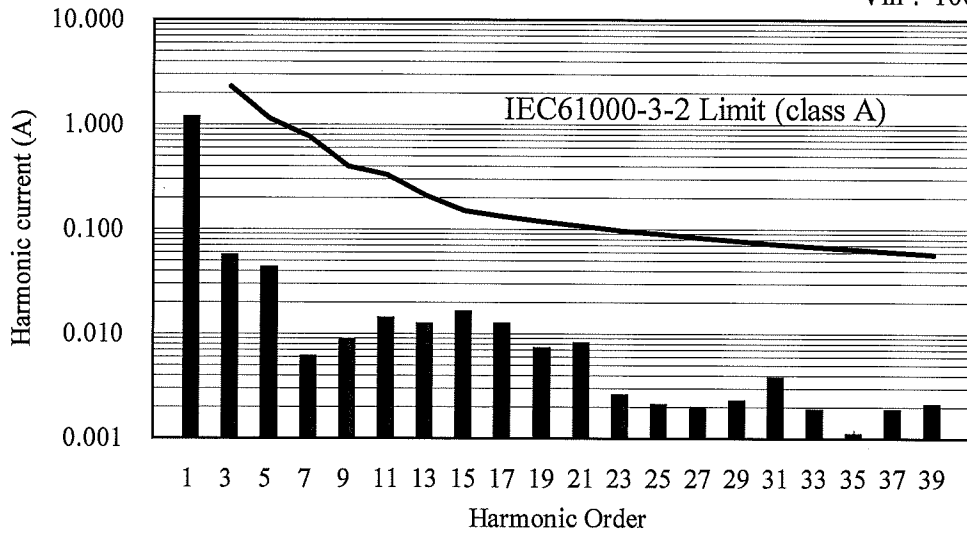
2.11 高調波成分

Input current harmonics

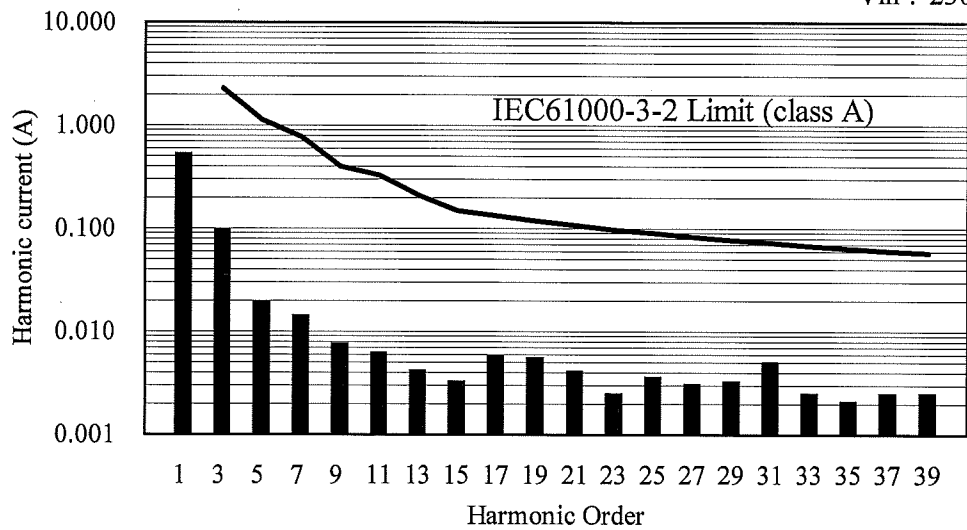
Conditions Iout : 100 %
Ta : 25 °C

5V

Vin : 100 VAC



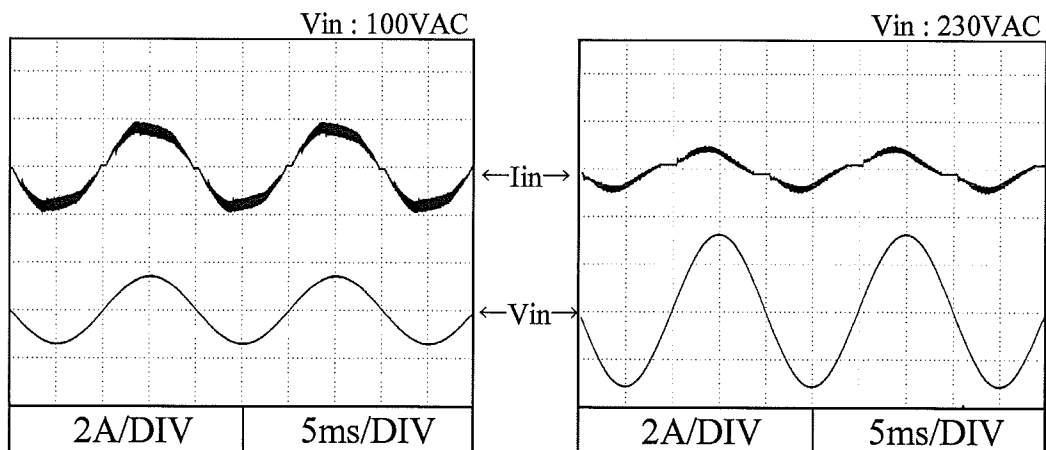
Vin : 230 VAC



2.12 入力電流波形

Input current waveform

Conditions Iout : 100 %
Ta : 25 °C



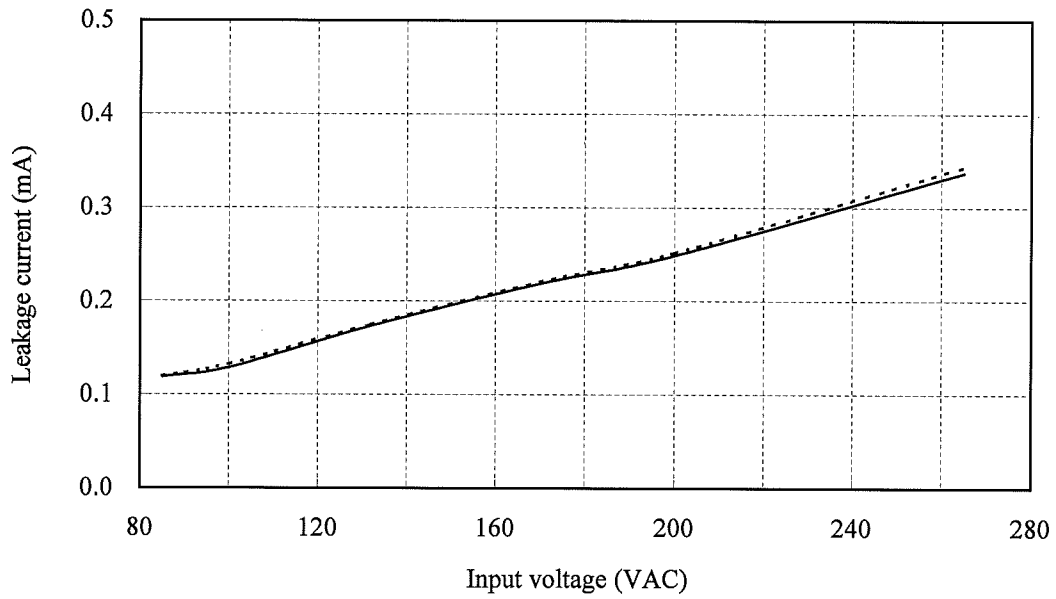
2.13 リーク電流特性

Leakage current characteristics

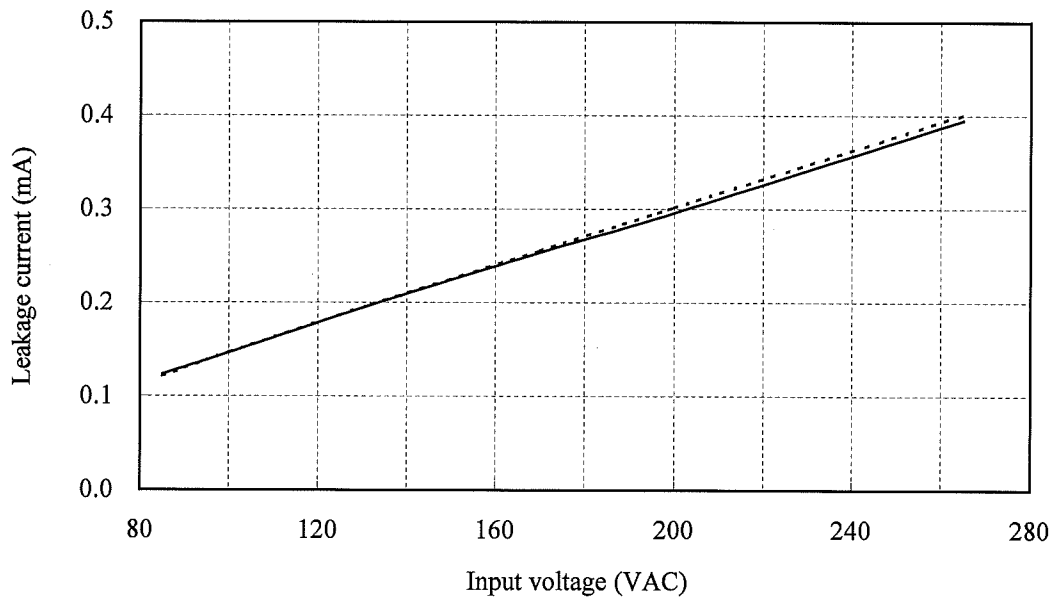
Conditions Iout : 0 % -----
 100 % ———
 Ta : 25 °C
Equipment used : 3156 (HIOKI)

5V

f: 50 Hz



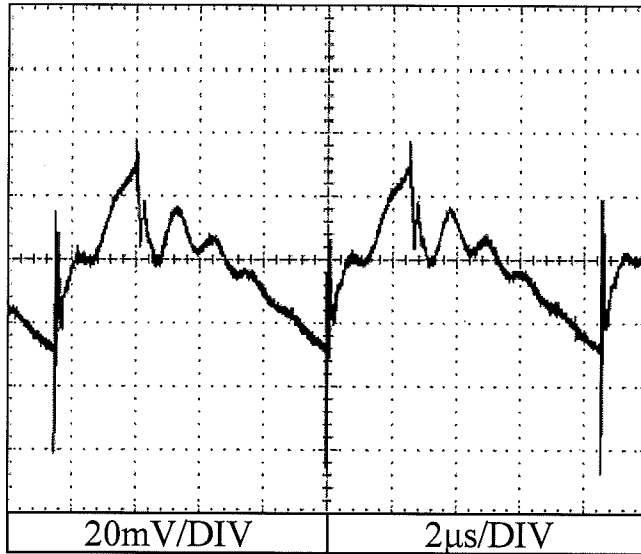
f: 60 Hz



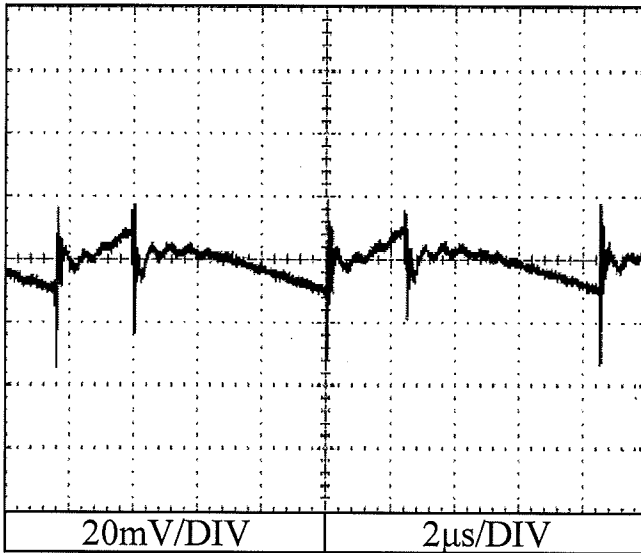
2.14 出力リップル、ノイズ波形
Output ripple and noise waveform

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

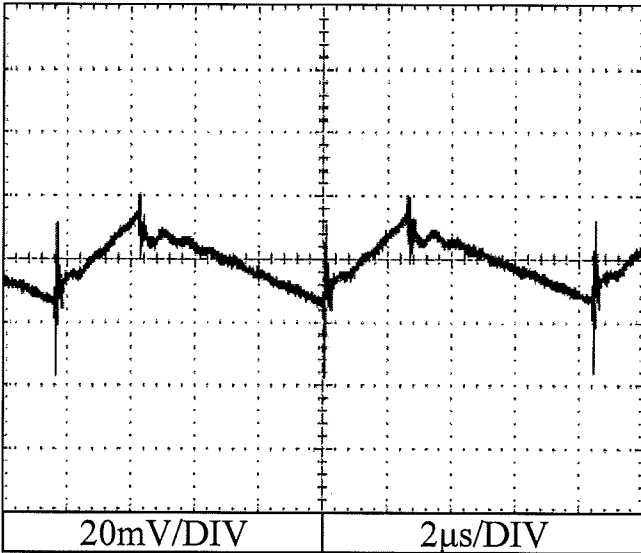
5V



12V



24V



2.15 EMI 特性

Electro-Magnetic Interference characteristics

Conditions Vin : 230 VAC

Iout : 100 %

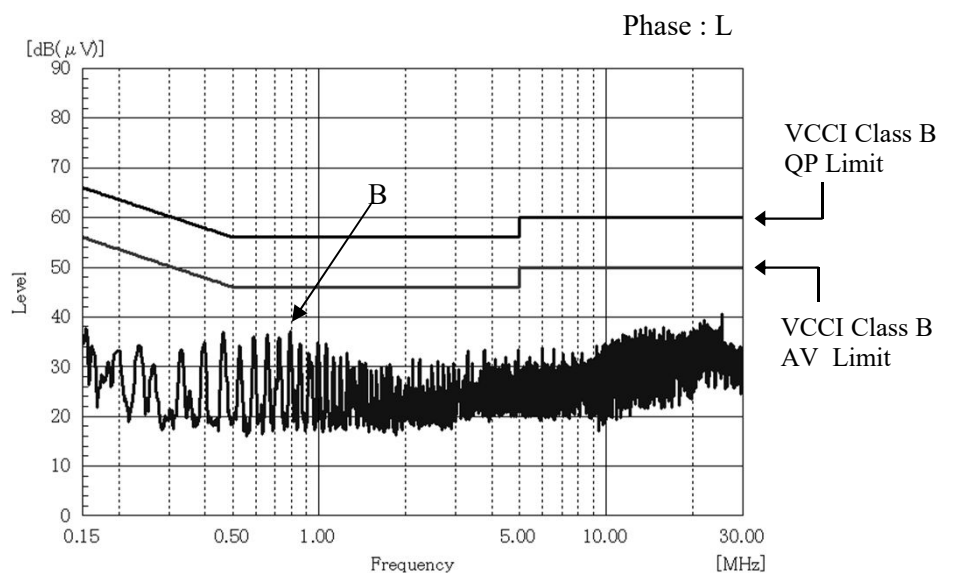
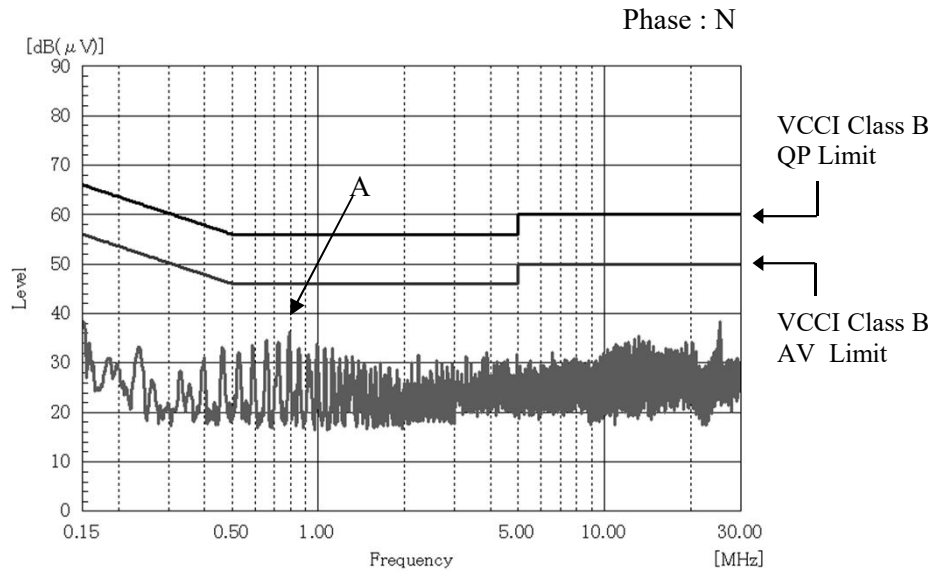
Ta : 25 °C

雑音端子電圧

Conducted Emission

5V

Point A (781kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	56.0	34.2
AV	46.0	26.5



Point B (784kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	56.0	35.7
AV	46.0	27.9

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

2.15 EMI 特性

Electro-Magnetic Interference characteristics

Conditions Vin : 230 VAC

Iout : 100 %

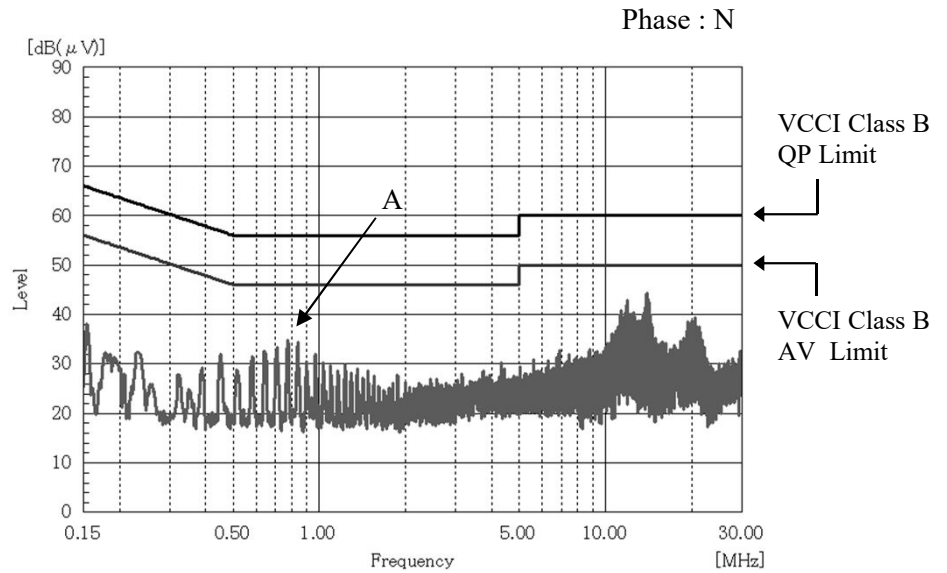
Ta : 25 °C

雑音端子電圧

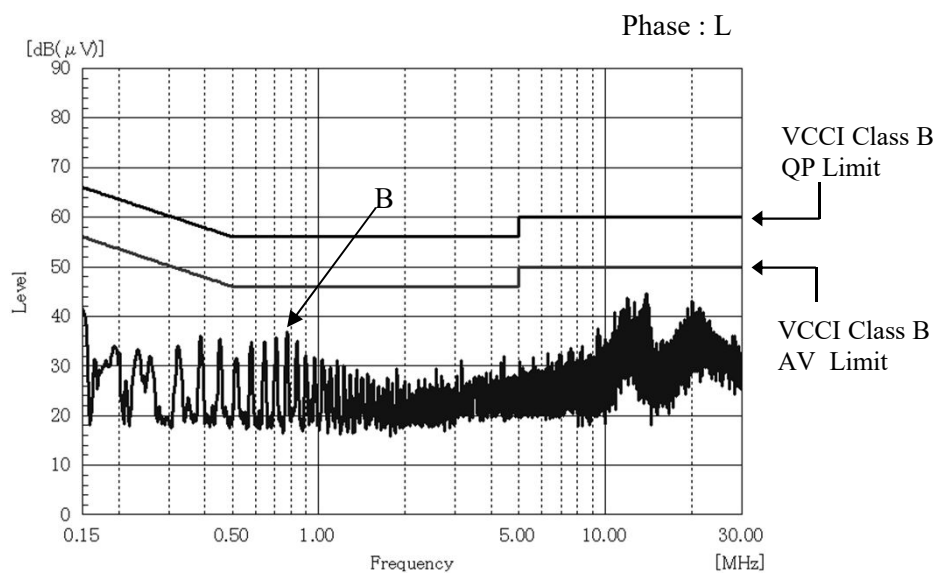
Conducted Emission

12V

Point A (774kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	56.0	33.1
AV	46.0	25.3



Point B (774kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	56.0	34.1
AV	46.0	27.0



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

2.15 EMI 特性

Electro-Magnetic Interference characteristics

Conditions Vin : 230 VAC

Iout : 100 %

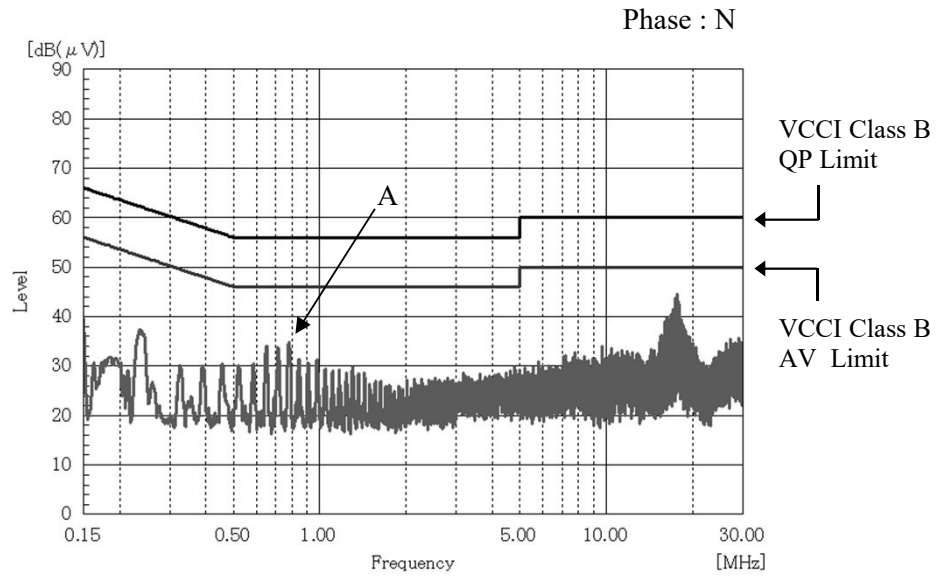
Ta : 25 °C

雑音端子電圧

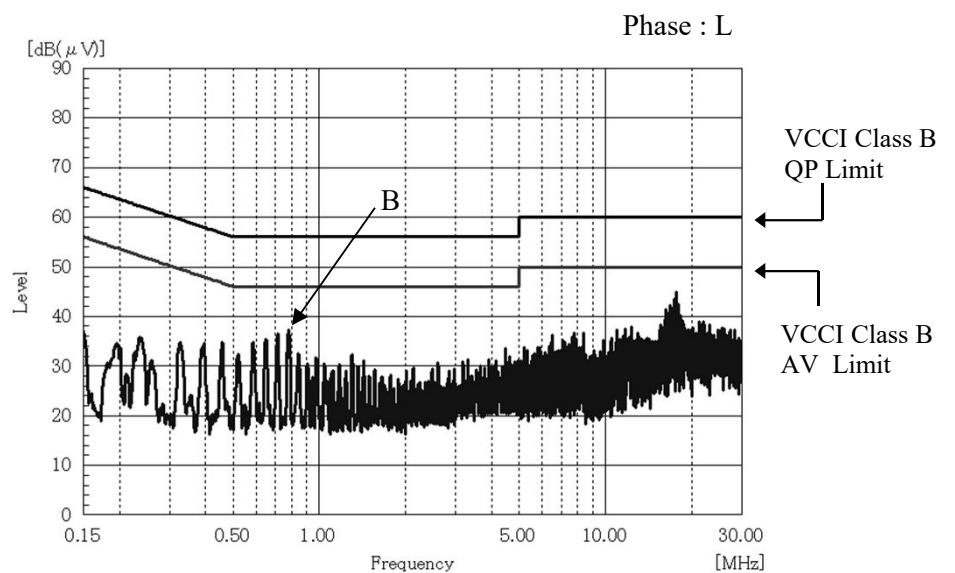
Conducted Emission

24V

Point A (776kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	56.0	34.0
AV	46.0	27.1



Point B (776kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	56.0	35.8
AV	46.0	28.8



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

2.15 EMI 特性

Electro-Magnetic Interference characteristics

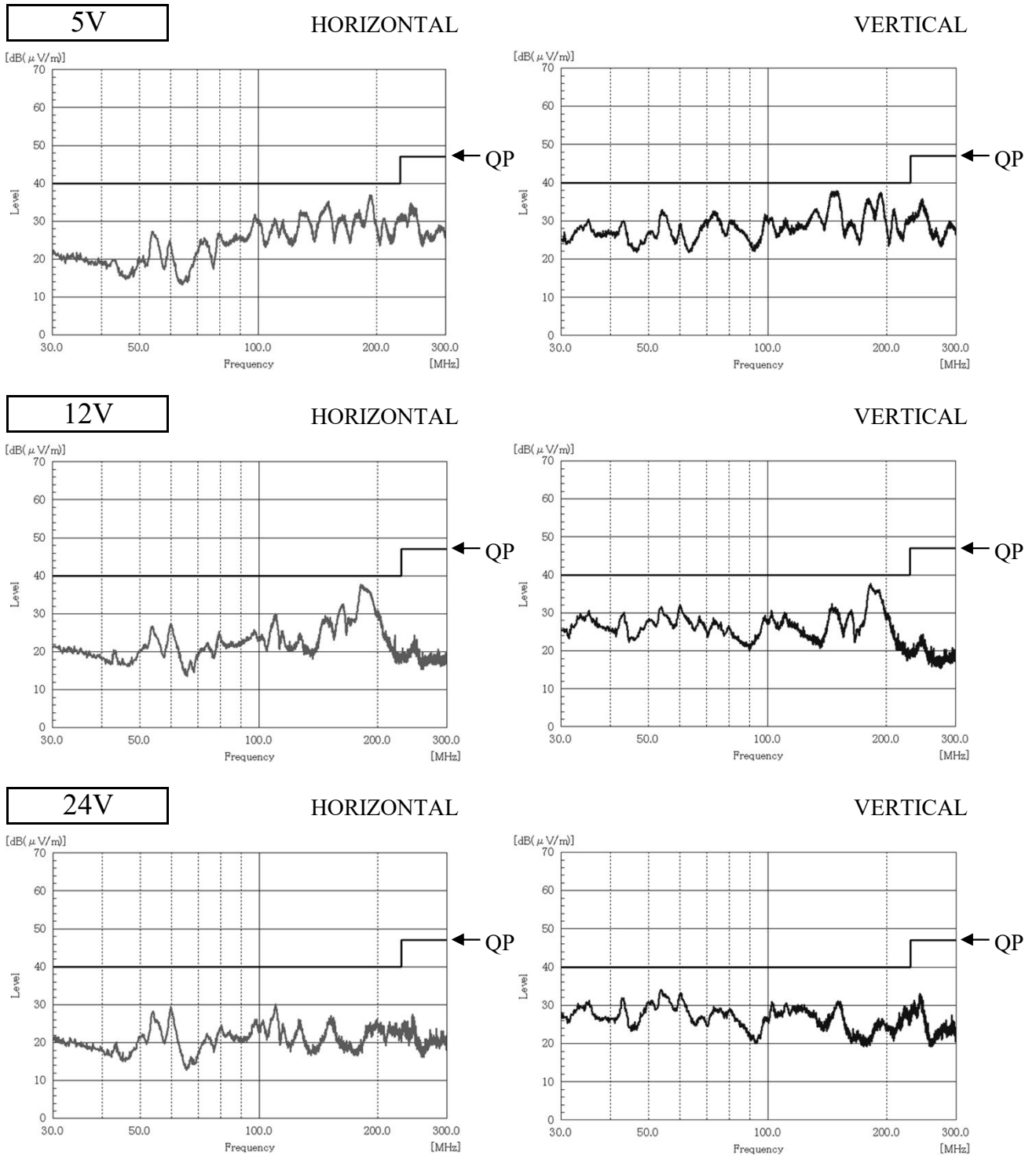
Conditions Vin : 230 VAC

Io : 100 %

Ta : 25 °C

雑音電界強度

Radiated Emission



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

表示はピーク値
Indication is peak values.