

# **EVS600W**

# **EVALUATION DATA**

# 型式データ

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## 2. 特性データ Characteristics

### 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

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(\*) 準標準品 /R にて対応 For alternative standard model /R

### ■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

■試験結果は、当社測定条件における結果であり、参考値としてお考え願います。

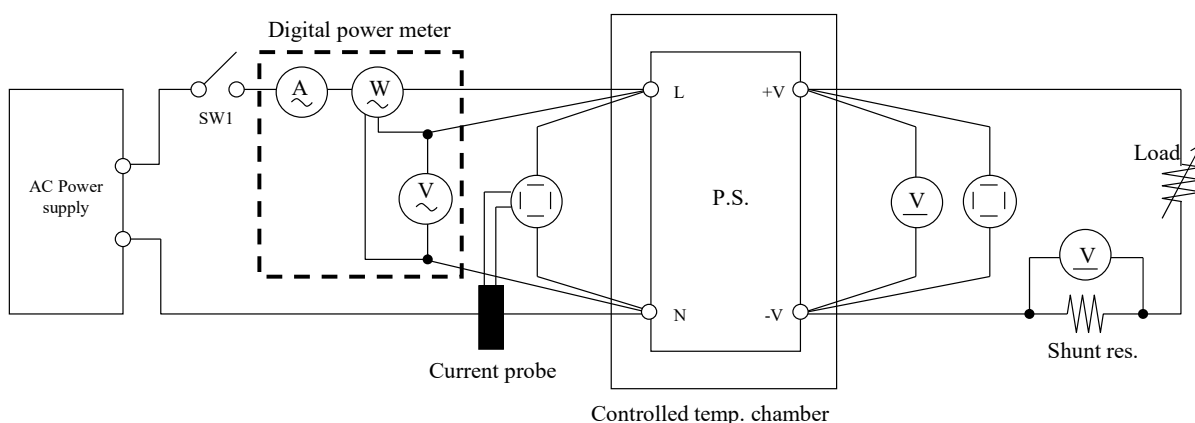
Test results are reference data based on our measurement condition.

# 1. 測定方法 Evaluation Method

## 1-1. 測定回路 Circuit used for determination

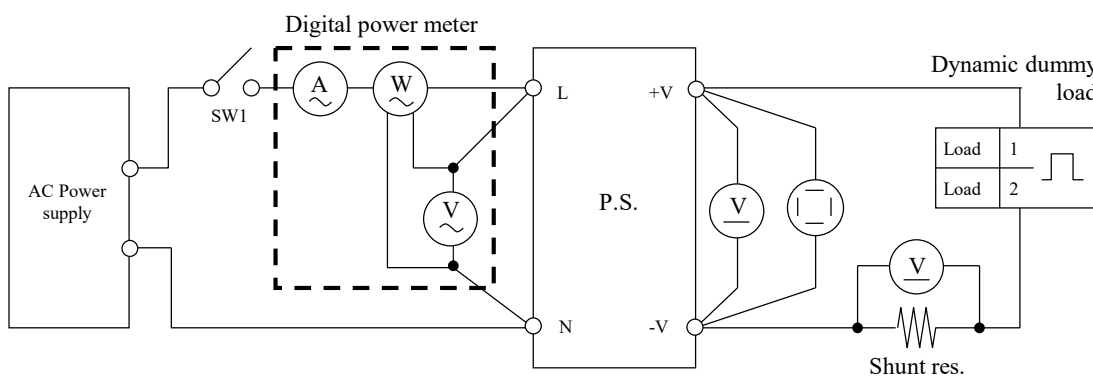
### 測定回路1 Circuit 1 used for determination

- 静特性 Steady state data
- 通電ドリフト特性 Warm up voltage drift characteristics
- 出力保持時間特性 Hold up time 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
- 出力電流対出力電圧特性 Output current vs. Output voltage characteristics
- 過電圧保護特性 Over voltage protection (OVP) characteristics
- 入力電圧瞬停特性 Response to brown out characteristics
- 入力電流波形 Input current waveform

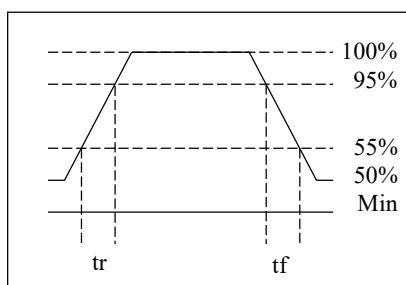


### 測定回路2 Circuit 2 used for determination

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

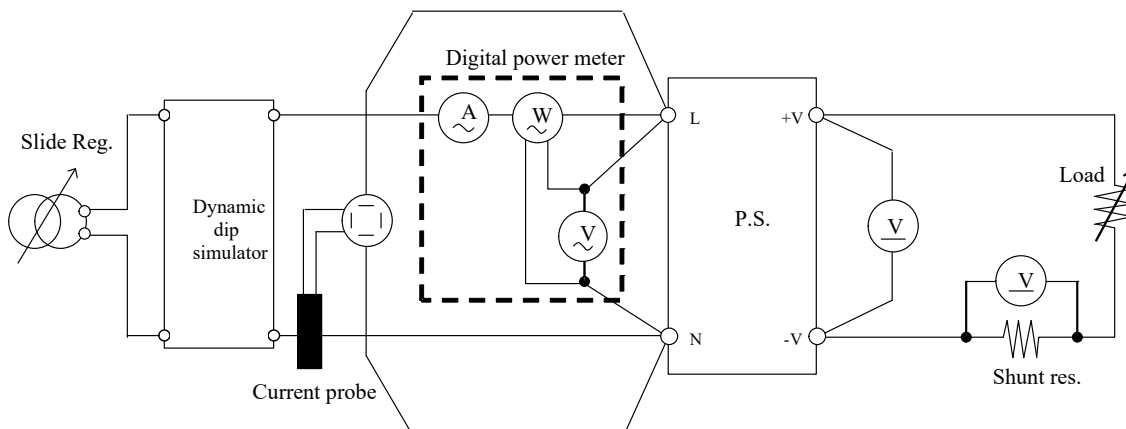


Output current waveform  
Iout 50%  $\longleftrightarrow$  100%



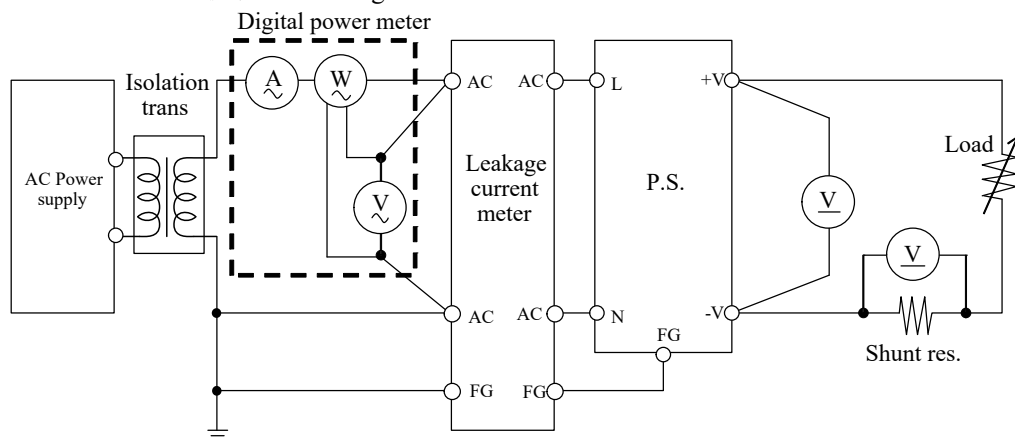
測定回路3 Circuit 3 used for determination

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



測定回路4 Circuit 4 used for determination

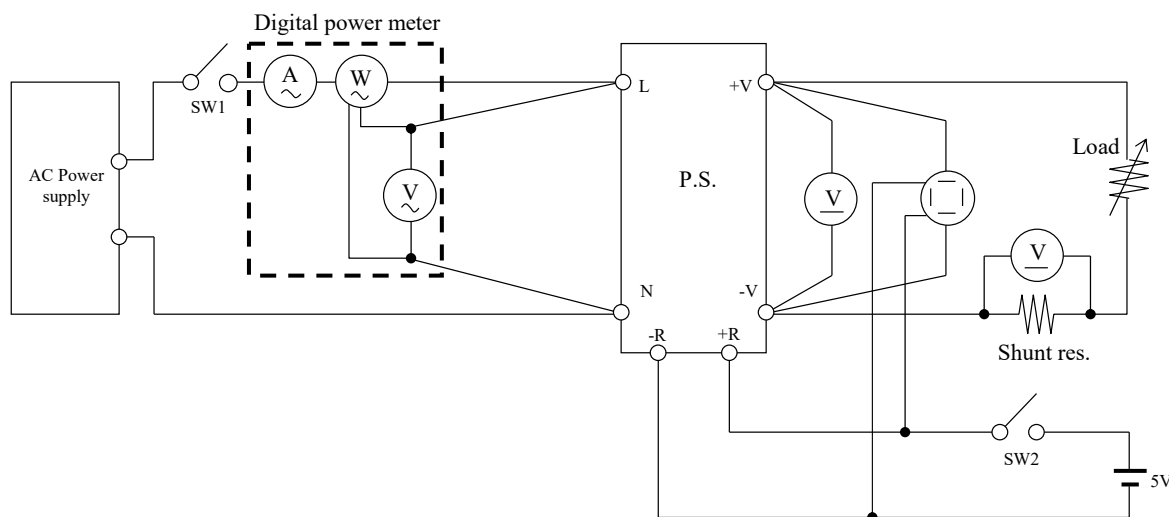
- リーク電流特性 Leakage current characteristics



測定回路5 Circuit 5 used for determination

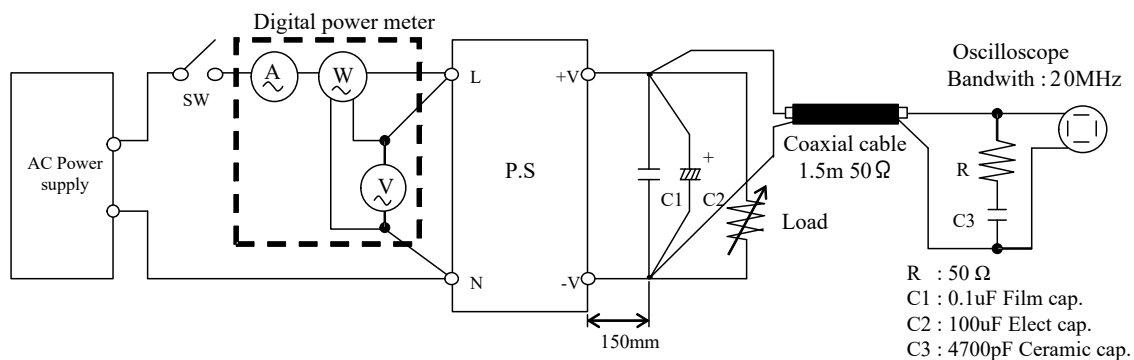
- ON/OFFコントロール時出力立ち上がり、立ち下がり特性  
Output rise, fall characteristics with ON/OFF Control

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



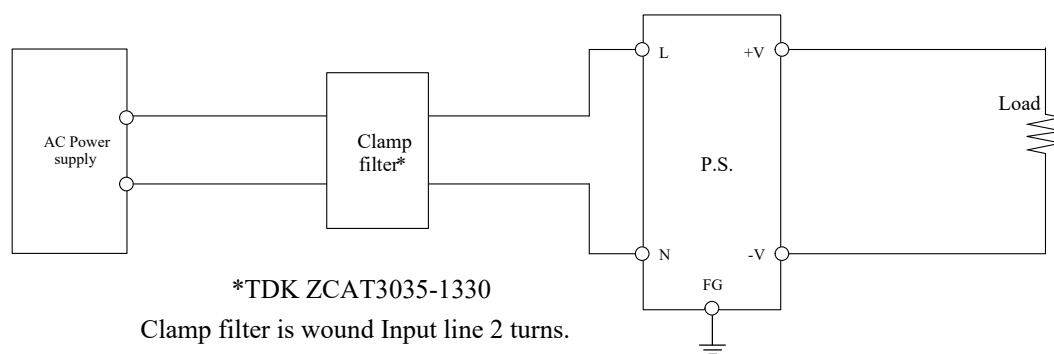
測定回路6 Circuit 6 used for determination

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



測定回路7 Circuit 7 used for determination

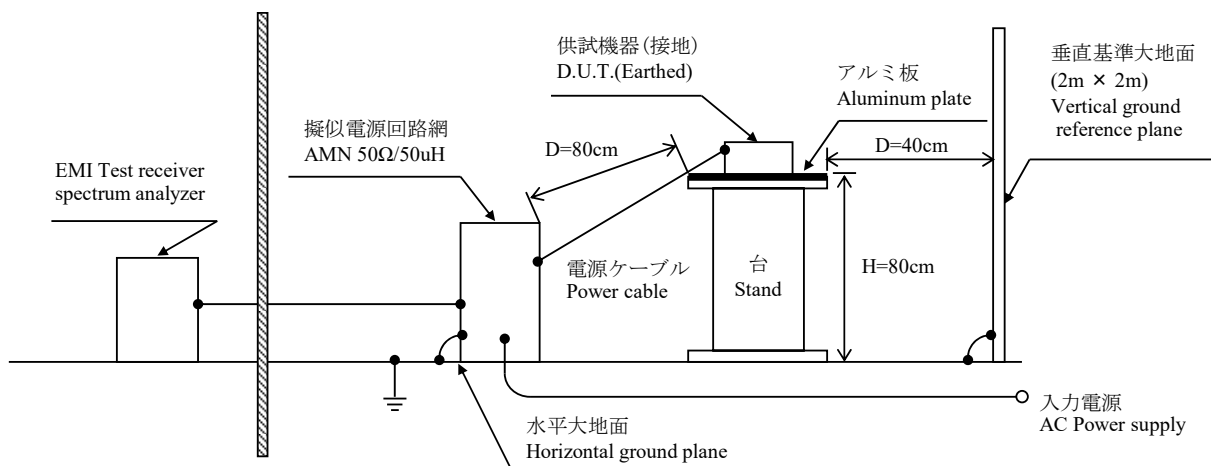
- EMI特性 Electro-Magnetic Interference characteristics  
雑音電界強度(放射ノイズ) Radiated Emission



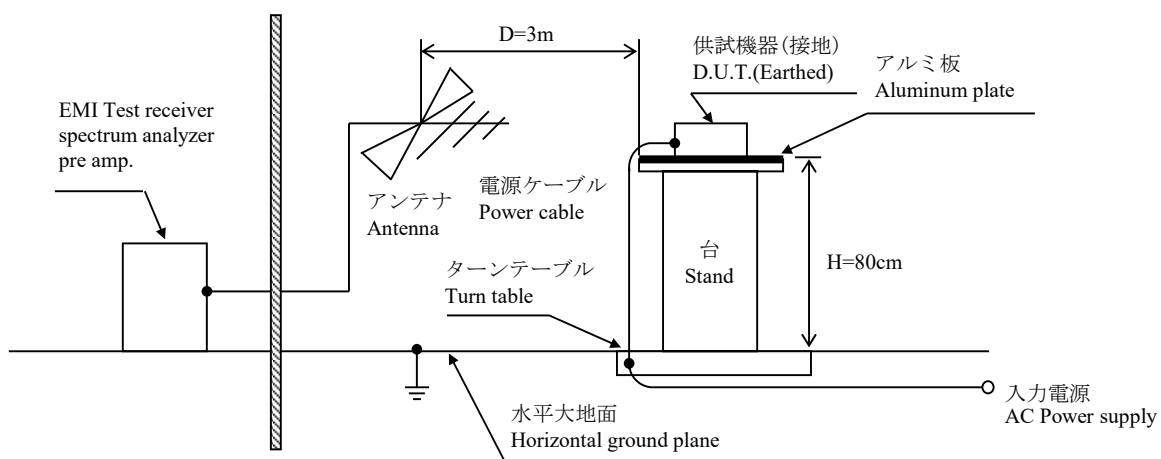
### 測定構成 Configuration used for determination

- 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	YOKOGAWA ELECT.	DL9040L / DLM2054
2	DIGITAL MULTIMETER	AGILENT	34970A
3	DIGITAL POWER METER	HIOKI	3334
4	DIGITAL POWER METER	YOKOGAWA ELECT.	WT110 / WT210
5	CURRENT PROBE	YOKOGAWA ELECT.	701928 / 701930
6	DYNAMIC DUMMY LOAD	TAKASAGO	FK-1000L
7	DUMMY LOAD	PCN	PHF250 SERIES
8	ISOLATION TRANS	MATSUNAGA	3WTC-50K
9	CVCF	TAKASAGO	AA2000XG
10	CVCF	KIKUSUI	PCR2000L / PCR4000L
11	CVCF	NF	ES10000S
12	LEAKAGE CURRENT METER	HIOKI	3156
13	DYNAMIC DIP SIMULATOR	TAKAMISAWA	PSA-210
14	CONTROLLED TEMP. CHAMBER	ESPEC	SU-642
15	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESCI
16	PRE AMP.	SONOMA	310N
17	AMN	SCHWARZBECK	NNLK8121
18	ANTENNA	SCHWARZBECK	CBL6111D
19	HARMONIC / FLICKER ANALYZER	KIKUSUI	KHA1000
20	SINGLE-PHASE MASTER	NF	4420
21	REFERENCE IMPEDANCE NETWORK 20A	NF	4150
22	MULTI OUTLET UNIT	KIKUSUI	OT01-KHA

## 1-3. 評価負荷条件 Load conditions

\*入力電圧が110VAC未満の場合、下記のとおり出力ディレーティングが必要です。

Output derating is required for DC input voltage less than 110VAC.

Vin	Iout : Full load
110 - 265VAC	100%
100VAC	92%
85VAC	80%



## 2. 特性データ Characteristics

### 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

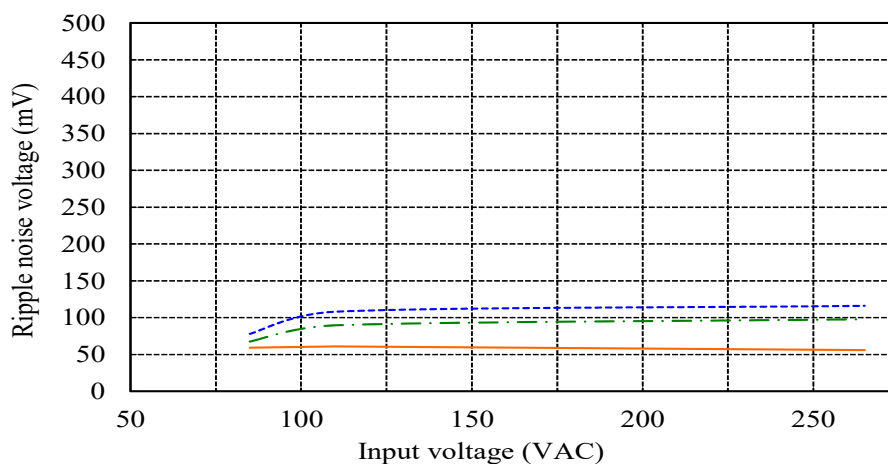
Regulation - line and load, Temperature drift / Start up voltage and Drop out voltage

36V	1. Regulation - line and load					Condition Ta : 25 °C	
Iout \ Vin	100VAC	110VAC	200VAC	265VAC	line regulation		
0%	35.985V	35.985V	35.985V	35.985V	0mV	0.000%	
50%	35.978V	35.978V	35.978V	35.978V	0mV	0.000%	
Full load	35.972V	35.971V	35.971V	35.971V	1mV	0.003%	
load	13mV	14mV	14mV	14mV			
regulation	0.036%	0.039%	0.039%	0.039%			
2. Temperature drift					Conditions Vin : 110 VAC Iout : 100 %		
Ta	-20°C	+25°C	+50°C	temperature stability			
Vout	35.869V	35.971V	35.949V	102mV	0.283%		
3. Start up voltage and Drop out voltage					Conditions Ta : 25 °C Iout : 100 %		
Start up voltage (Vin)		80VAC					
Drop out voltage (Vin)		66VAC					
57V	1. Regulation - line and load					Condition Ta : 25 °C	
Iout \ Vin	100VAC	110VAC	200VAC	265VAC	line regulation		
0%	56.981V	56.981V	56.981V	56.981V	0mV	0.000%	
50%	56.970V	56.970V	56.970V	56.970V	0mV	0.000%	
Full load	56.972V	56.982V	56.972V	56.972V	10mV	0.018%	
load	11mV	12mV	11mV	11mV			
regulation	0.019%	0.021%	0.019%	0.019%			
2. Temperature drift					Conditions Vin : 110 VAC Iout : 100 %		
Ta	-20°C	+25°C	+50°C	temperature stability			
Vout	56.956V	56.982V	56.997V	41mV	0.072%		
3. Start up voltage and Drop out voltage					Conditions Ta : 25 °C Iout : 100 %		
Start up voltage (Vin)		78VAC					
Drop out voltage (Vin)		62VAC					

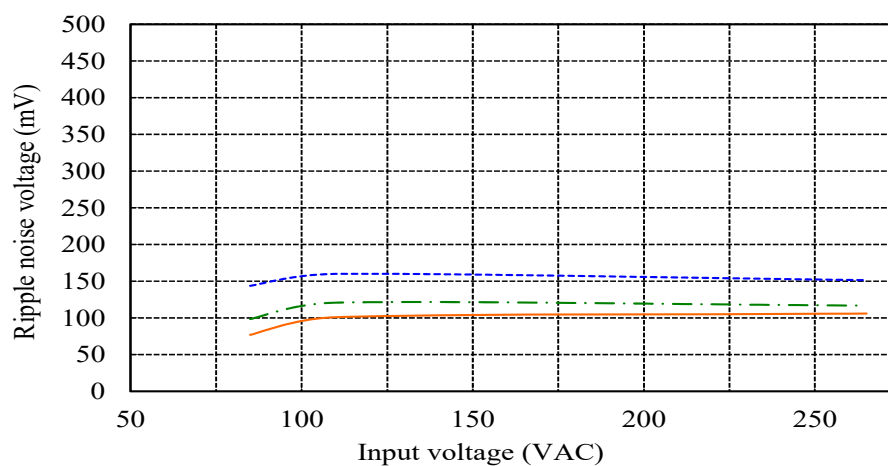
(2) リップルノイズ電圧対入力電圧 Ripple noise voltage vs. Input voltage

Conditions Iout: Full load  
 Ta : -20°C ---  
 25°C - - -  
 50°C ———

36V



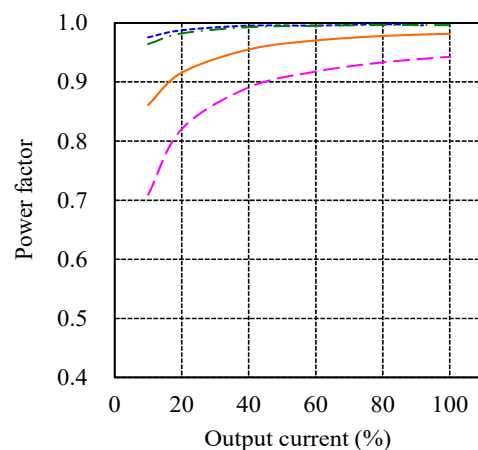
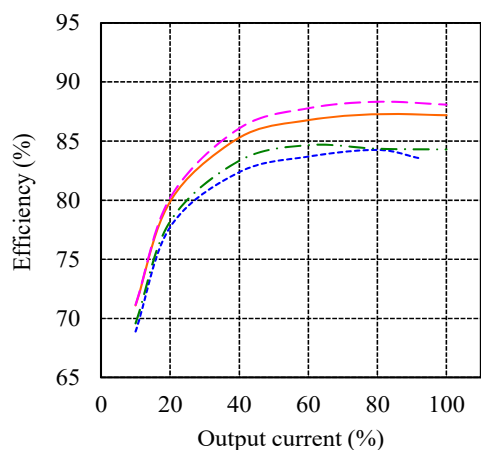
57V



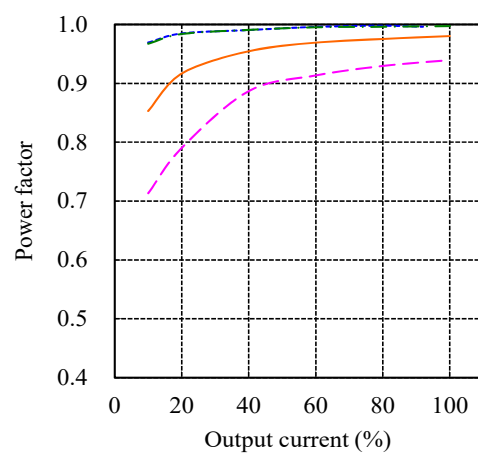
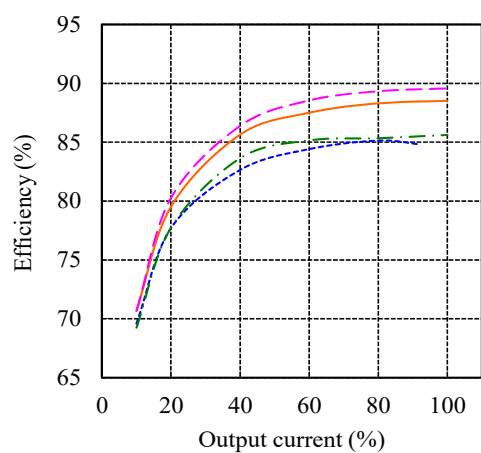
(3) 効率・力率対出力電流 Efficiency and Power factor vs. Output current

Conditions Vin : 100VAC ---  
 110VAC - - -  
 200VAC ———  
 265VAC - · - ·  
 Ta : 25°C

36V



57V

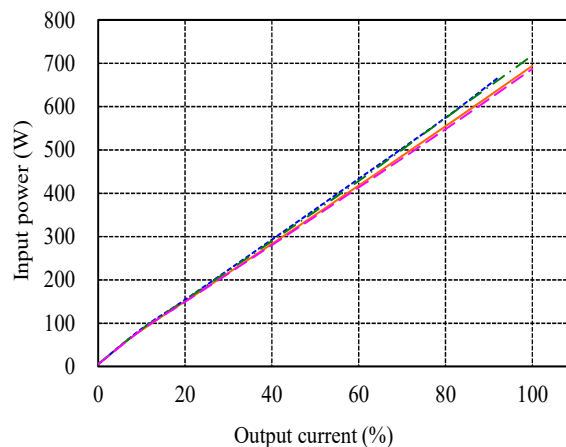


(4) 入力電力対出力電流 Input power vs. Output current

Conditions Vin : 100VAC ---  
 110VAC - - -  
 200VAC ———  
 265VAC - · - ·  
 Ta : 25°C

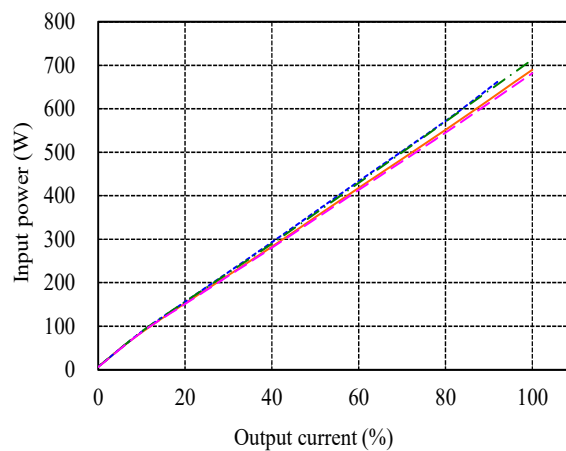
36V

Vin	Input power
	Iout : 0%
100VAC	5.3W
110VAC	5.5W
200VAC	5.9W
265VAC	5.1W



57V

Vin	Input power
	Iout : 0%
100VAC	6.8W
110VAC	6.7W
200VAC	6.8W
265VAC	6.0W

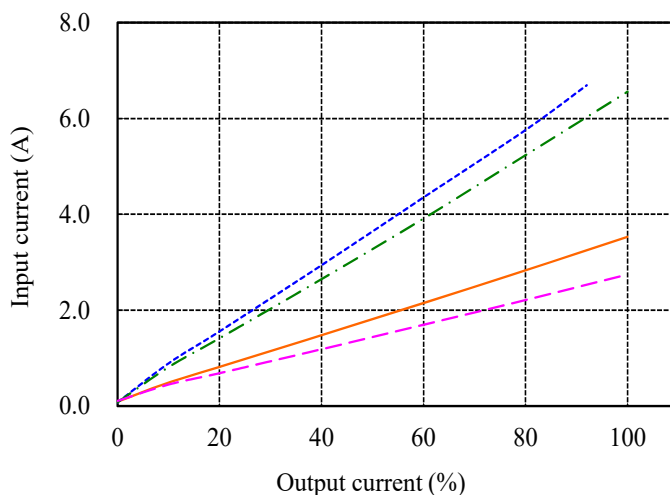


(5) 入力電流対出力電流 Input current vs. Output current

Conditions Vin : 100VAC ---  
 110VAC - - -  
 200VAC ---  
 265VAC - - -  
 Ta : 25°C

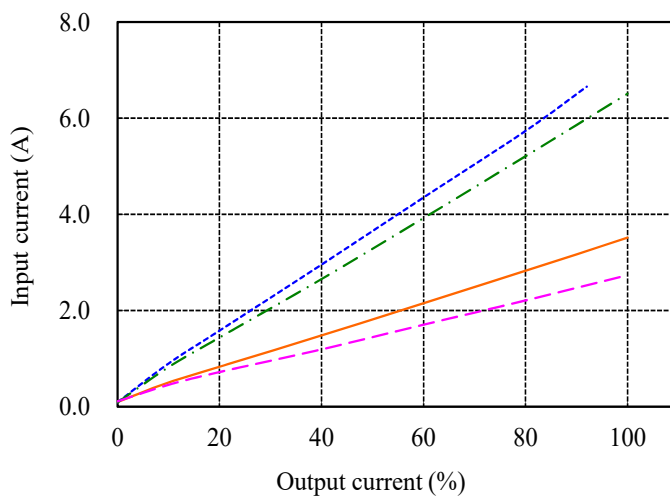
36V

Vin	Input current
	Iout : 0%
100VAC	0.08A
110VAC	0.08A
200VAC	0.09A
265VAC	0.11A



57V

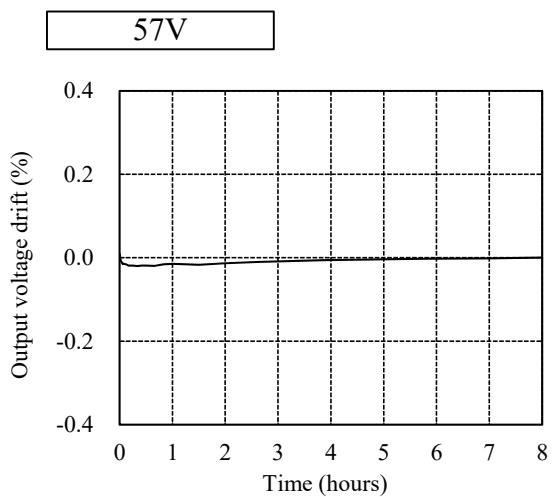
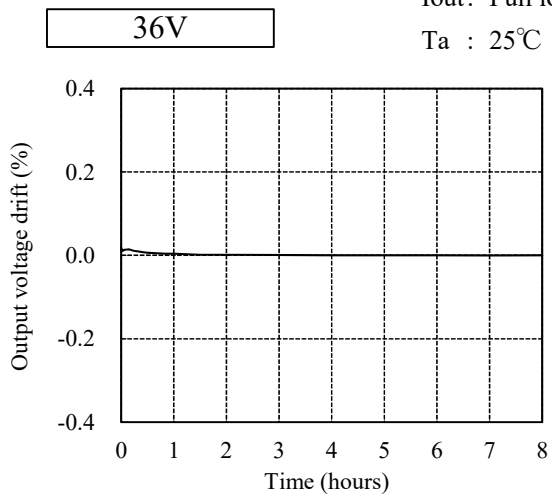
Vin	Input current
	Iout : 0%
100VAC	0.09A
110VAC	0.09A
200VAC	0.10A
265VAC	0.11A



2-2. 通電ドリフト特性

Warm up voltage drift characteristics

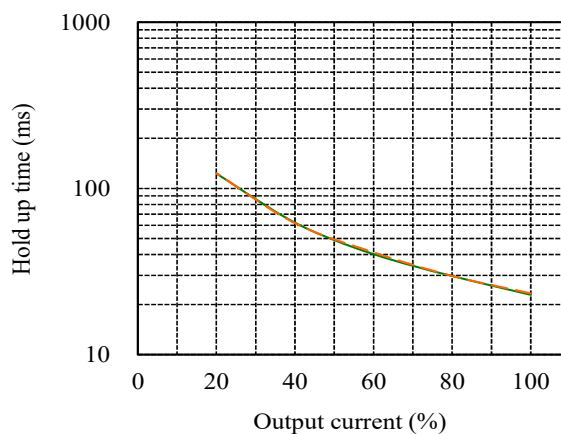
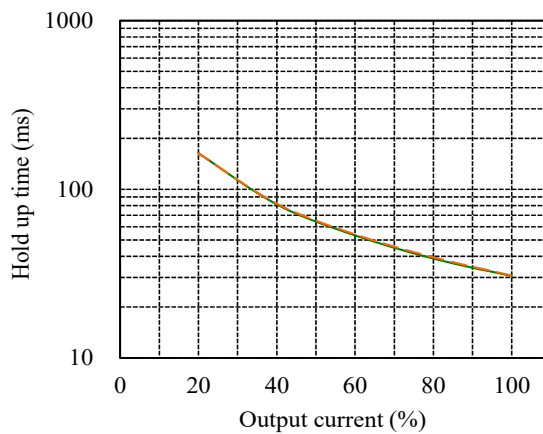
Conditions Vin : 110VAC  
Iout : Full load  
Ta : 25°C



2-3. 出力保持時間特性

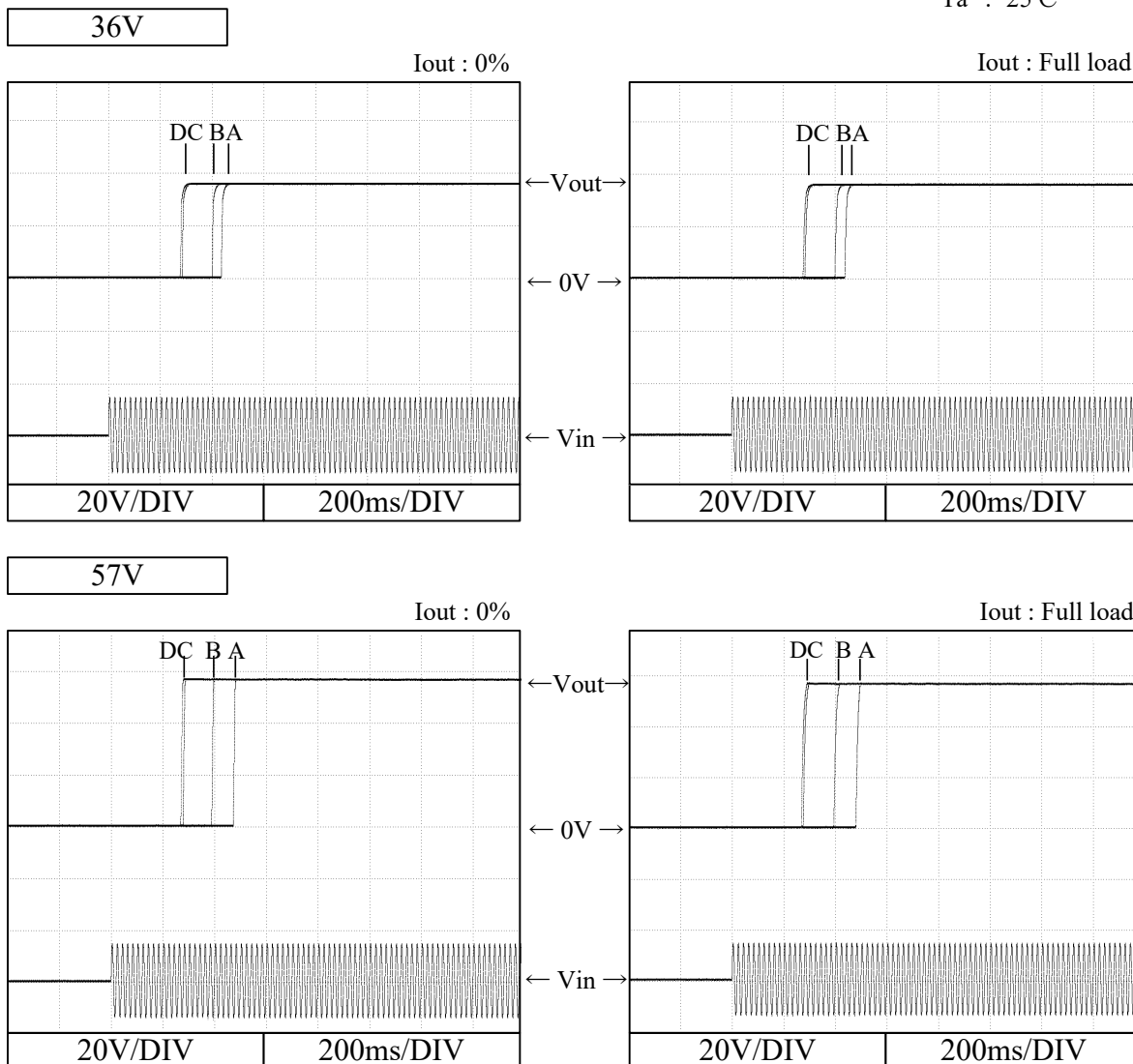
Hold up time characteristics

Conditions Vin : 110VAC  
200VAC  
Ta : 25°C



2-4. 出力立ち上がり特性 Output rise characteristics

Conditions Vin : 100VAC (A)  
 : 110VAC (B)  
 : 200VAC (C)  
 : 265VAC (D)  
 Ta : 25°C







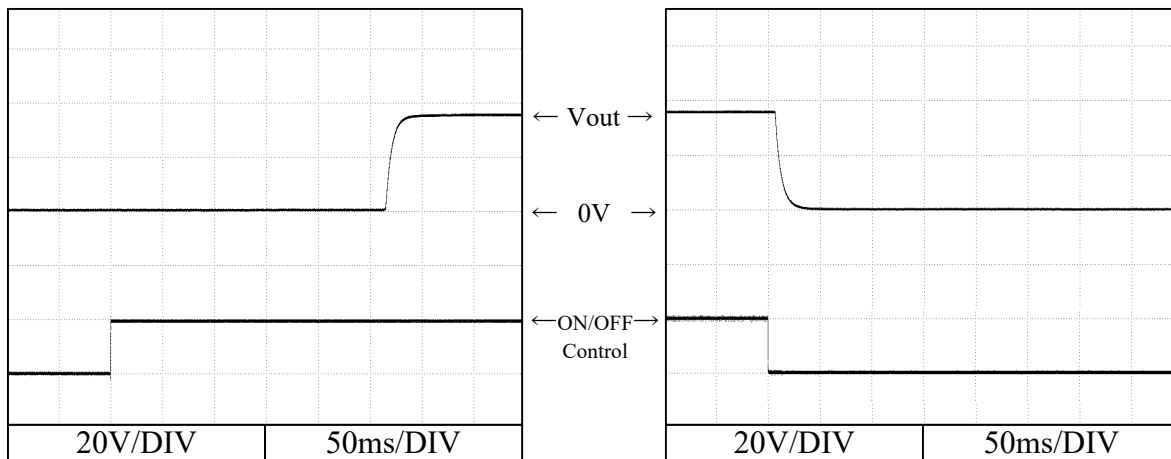
2-6. ON/OFFコントロール時出力立ち上がり、立ち下がり特性  
Output rise, fall characteristics with ON/OFF Control

標準品 /R にて対応

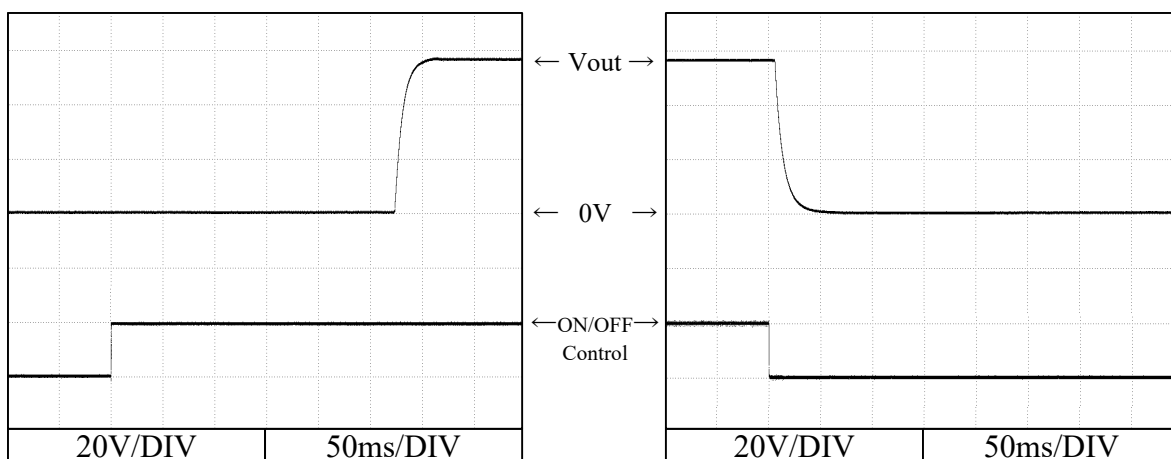
For alternative standard model /R

Conditions Vin : 110VAC  
Iout : Full load  
Ta : 25°C

36V



57V



2-7. 出力電流対出力電圧特性

Output current vs. Output voltage characteristics

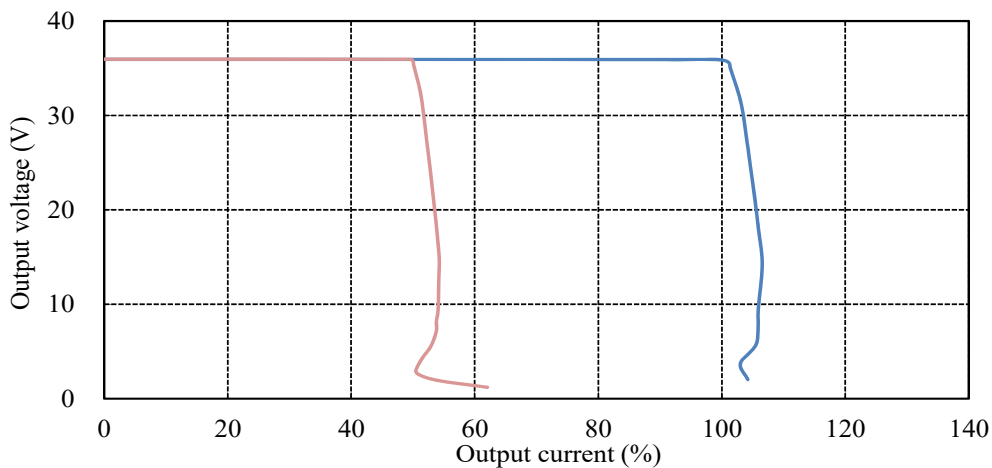
Conditions Vin : 110VAC

Vo setting 36V

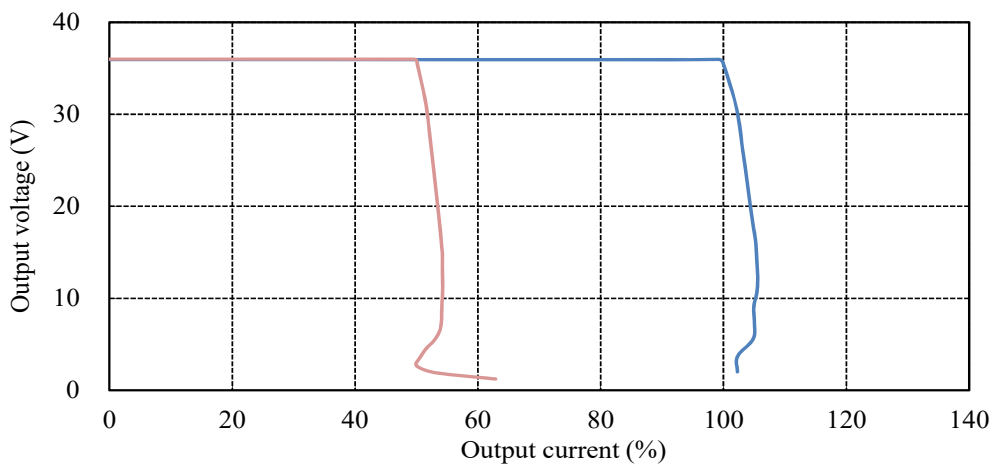
C.C. setting : 50% — (red line)  
 100% — (blue line)

36V

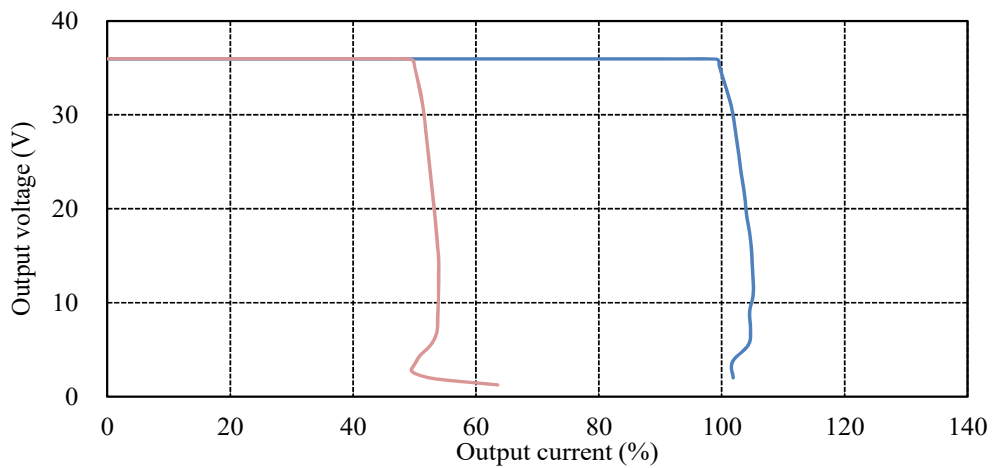
Ta : -20 °C



Ta : 25°C



Ta : 50°C



2-7. 出力電流対出力電圧特性

Output current vs. Output voltage characteristics

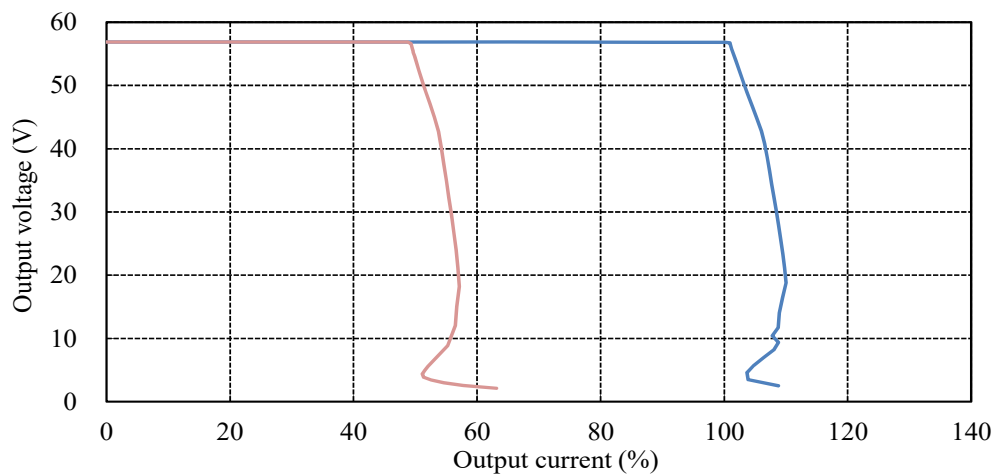
Conditions Vin : 110VAC

Vo setting 57V

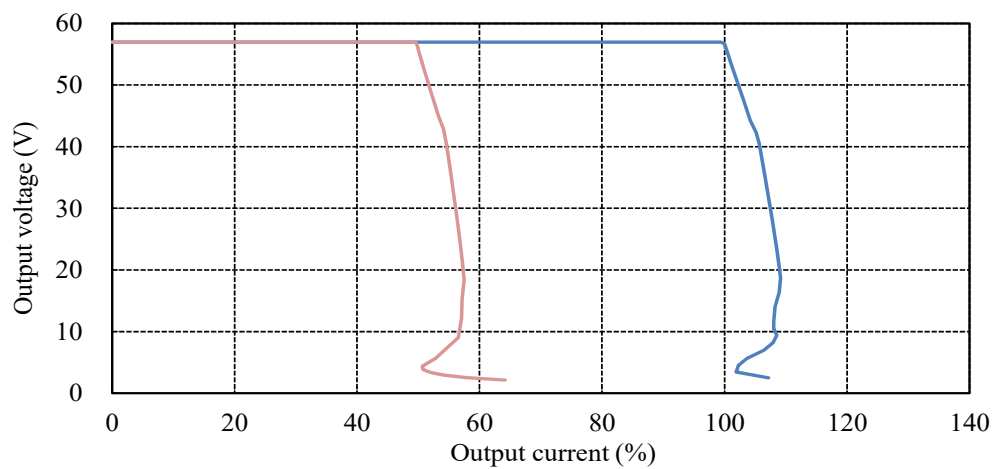
C.C. setting : 50% — (red line)  
 100% — (blue line)

57V

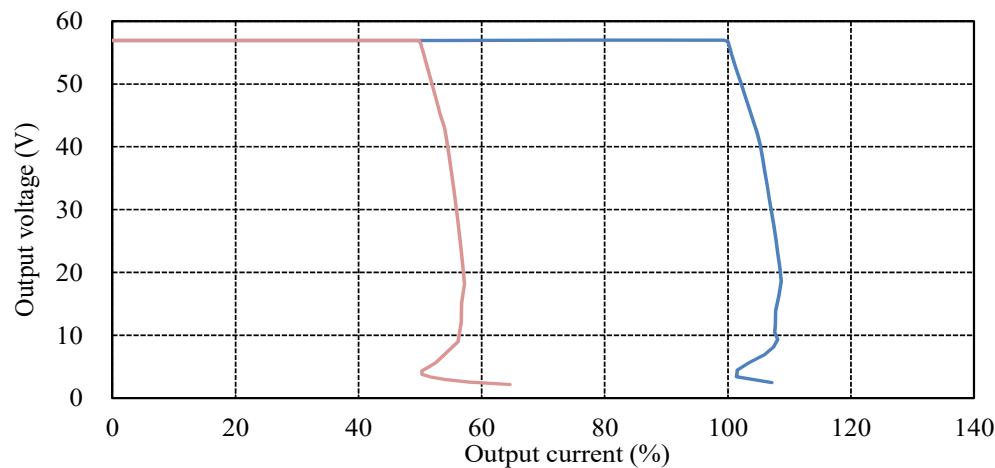
Ta : -20°C



Ta : 25 °C



Ta : 50°C

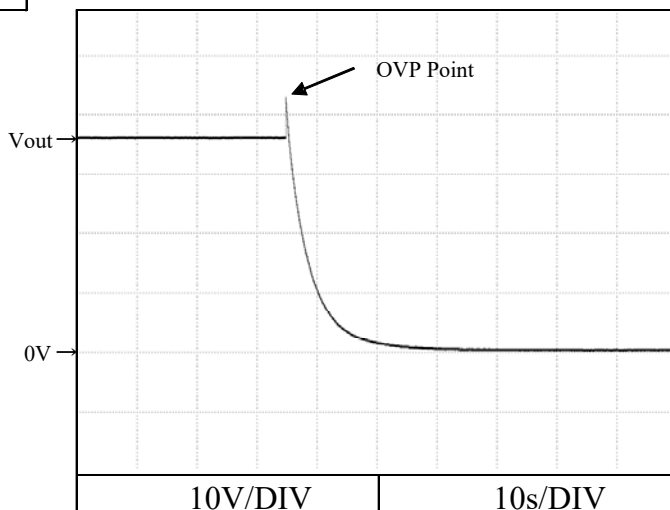


2-8. 過電圧保護特性

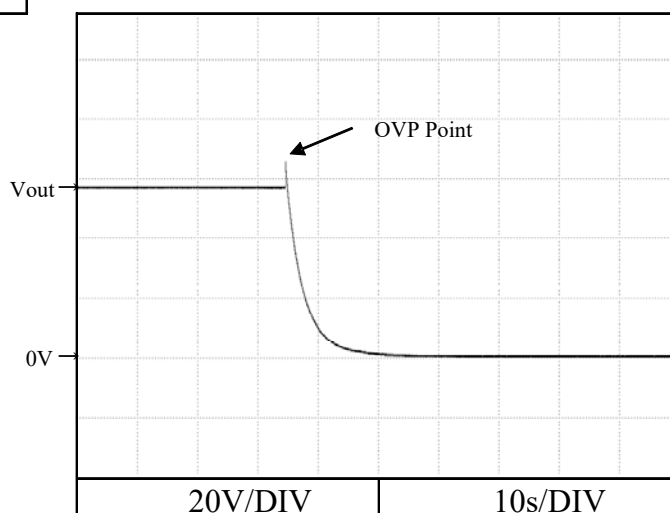
Over voltage protection (OVP) characteristics

Conditions Vin : 100VAC  
Iout : 0%  
Ta : 25°C

36V



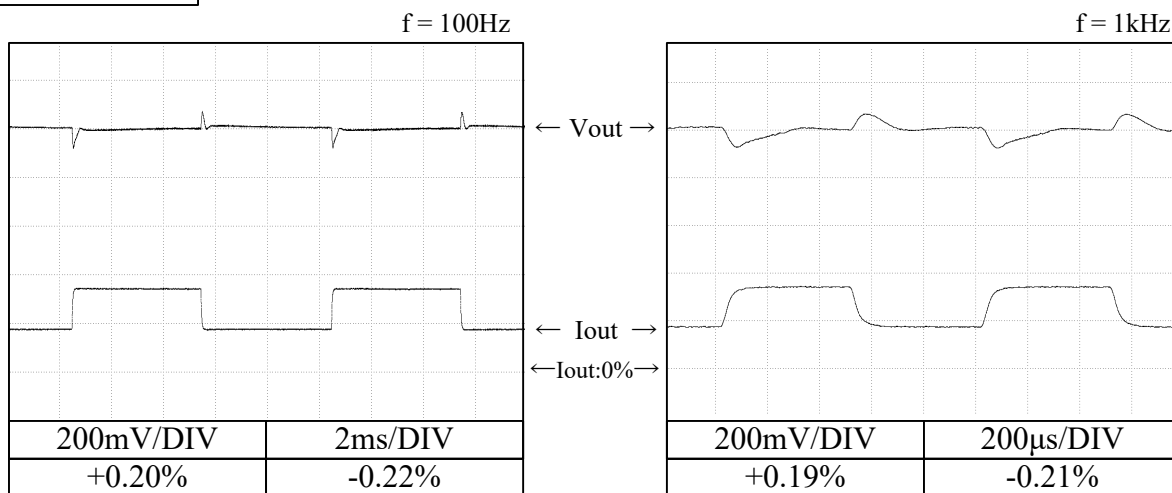
57V



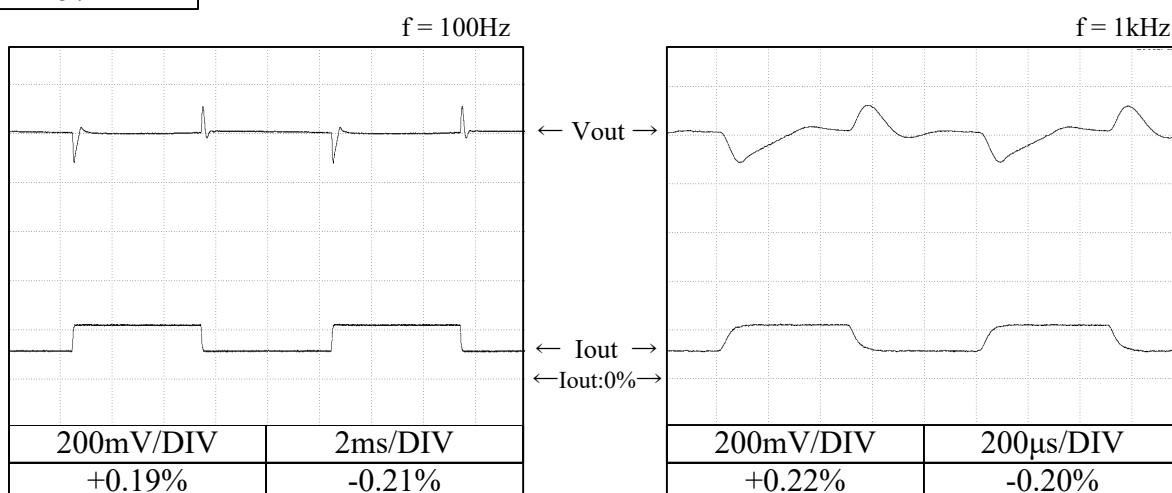
2-9. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions Vin : 110VAC  
 Iout : 50% $\leftrightarrow$ 100%  
 (tr = tf = 50 $\mu$ s)  
 Ta : 25°C

36V



57V



2-10. 入力電圧瞬停特性 Response to brown out characteristics

Conditions Iout: Full load

Ta : 25°C

瞬停時間 Interruption time

A : 出力電圧が低下なし Without any output voltage drop.

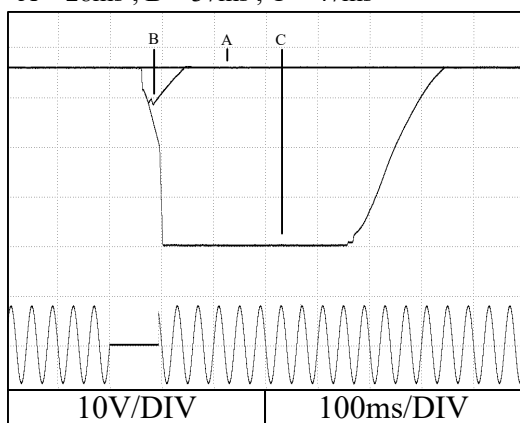
B : 出力電圧が20 - 40%低下 Output voltage to drop down to 20 - 40%.

C : 出力電圧が0Vまで低下 Output voltage to drop down to 0V.

**36V**

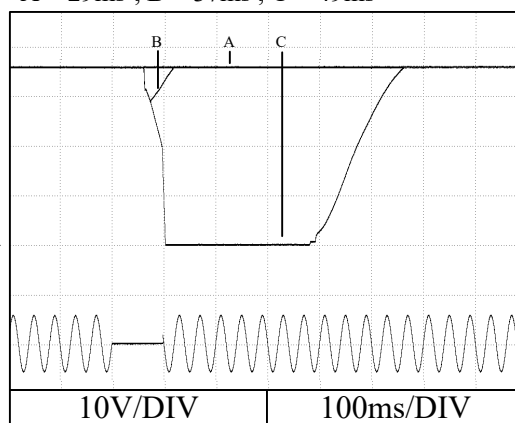
Vin : 110VAC

A = 28ms , B = 37ms , C = 47ms



Vin : 200VAC

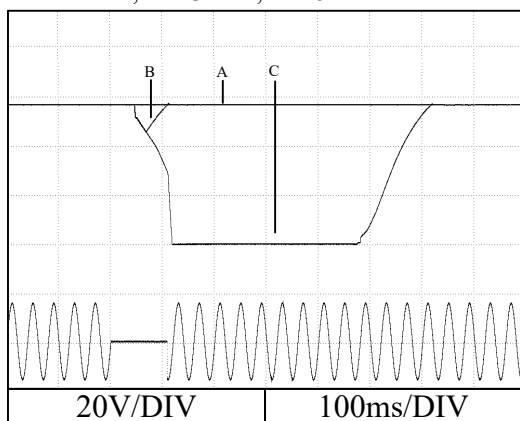
A = 29ms , B = 37ms , C = 49ms



**57V**

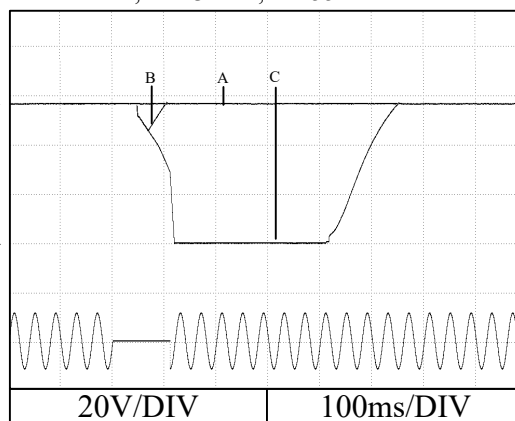
Vin : 110VAC

A = 22ms , B = 34ms , C = 54ms



Vin : 200VAC

A = 22ms , B = 34ms , C = 55ms

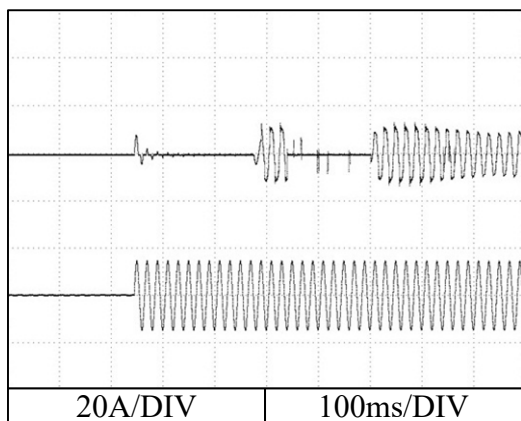


2-11. 入力サージ電流(突入電流)波形 Inrush current waveform

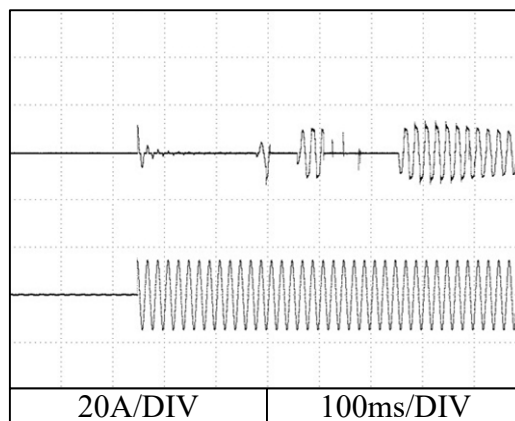
57V

Conditions Vin : 100VAC  
Iout : Full load  
Ta : 25°C

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

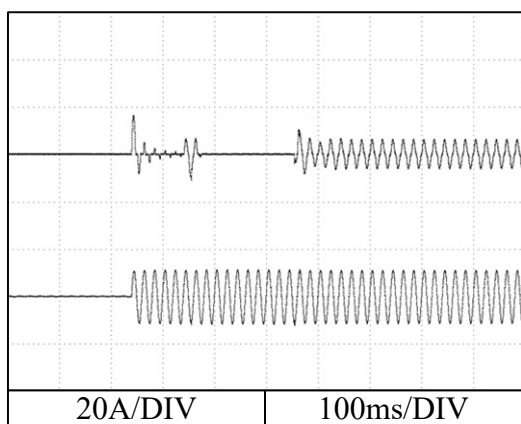


Switch on phase angle of input AC voltage  
 $\phi = 90^\circ$

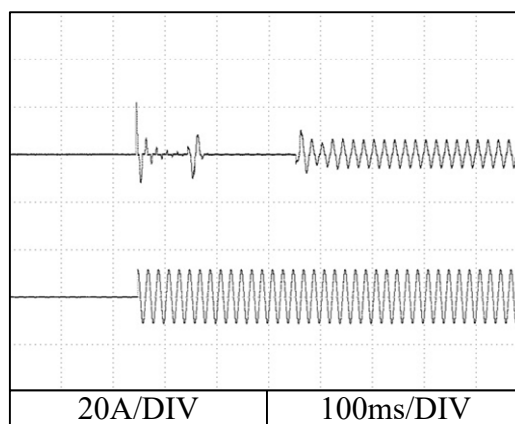


Conditions Vin : 200VAC  
Iout : Full load  
Ta : 25°C

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



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

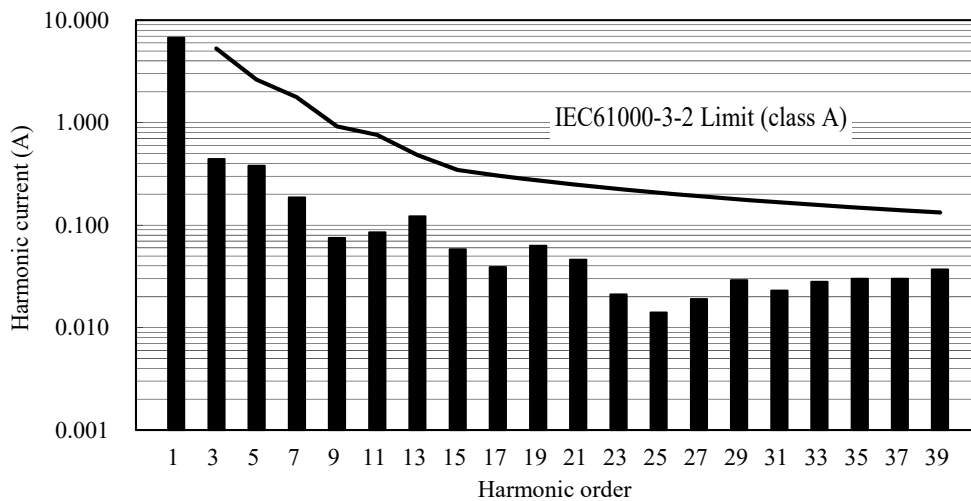


2-12. 高調波成分 Input current harmonics

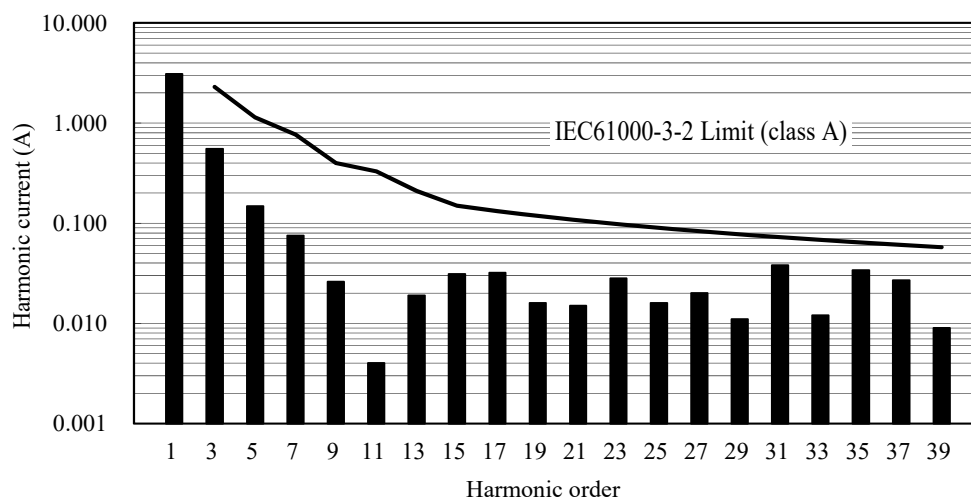
Conditions Iout: Full load  
Ta : 25°C

36V

Vin : 100VAC



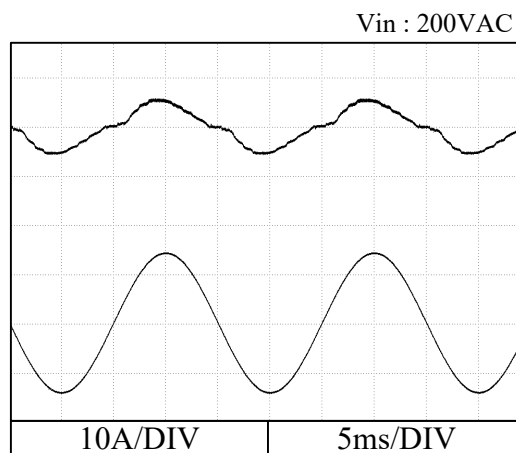
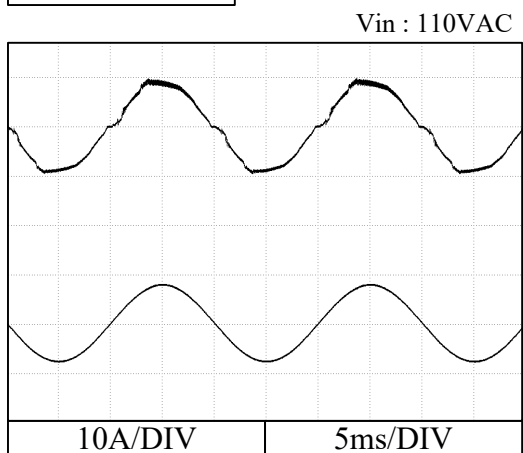
Vin : 230VAC



2-13. 入力電流波形 Input current waveform

Conditions Iout: Full load  
Ta : 25°C

57V



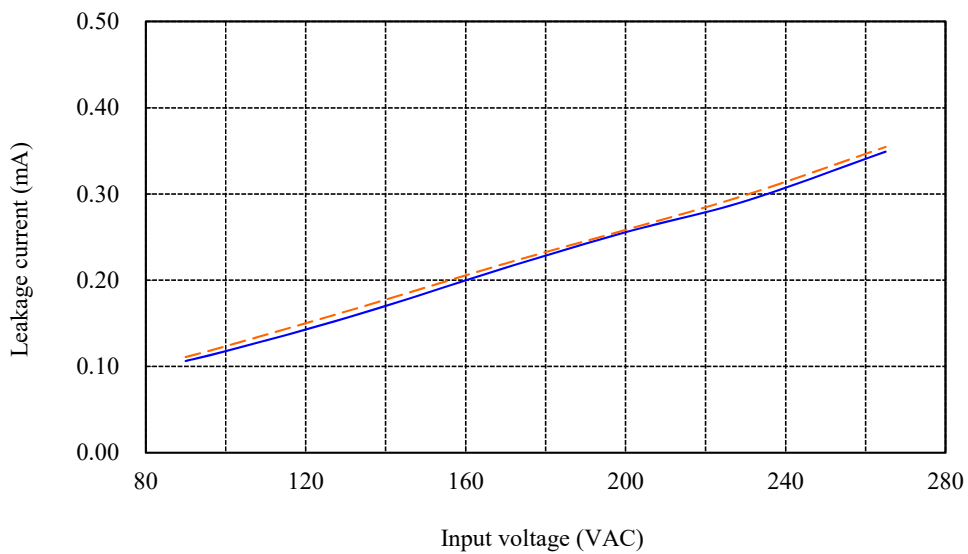


2-14. リーク電流特性 Leakage current characteristics

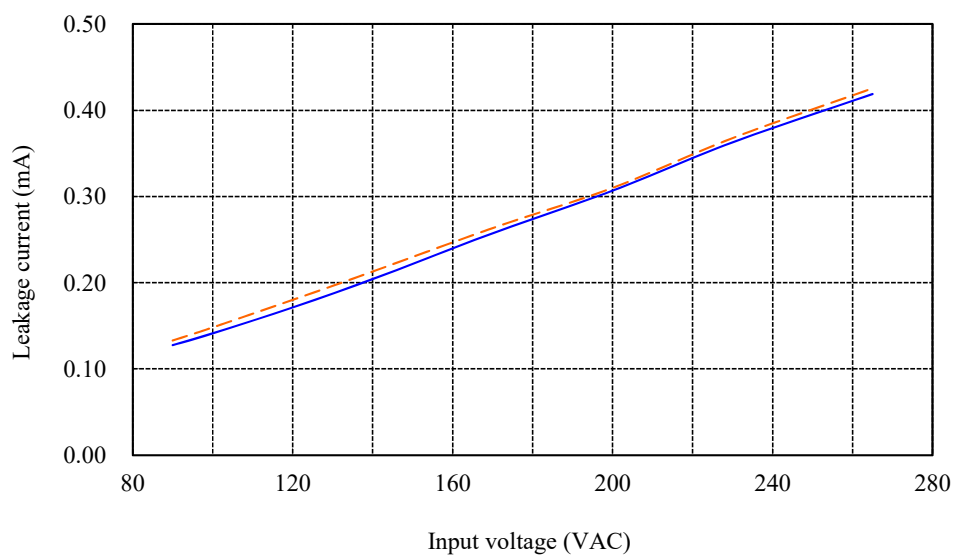
Conditions Iout: 0% ———  
 Full load - - - - -  
 Ta : 25°C  
 Equipment used : 3156 (HIOKI)

57V

f : 50Hz



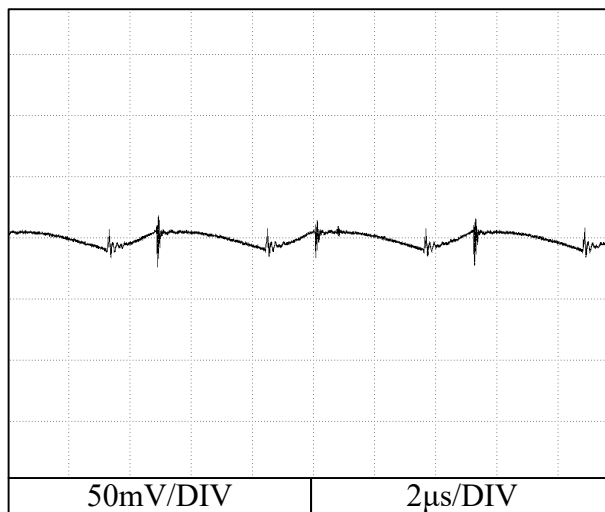
f : 60Hz



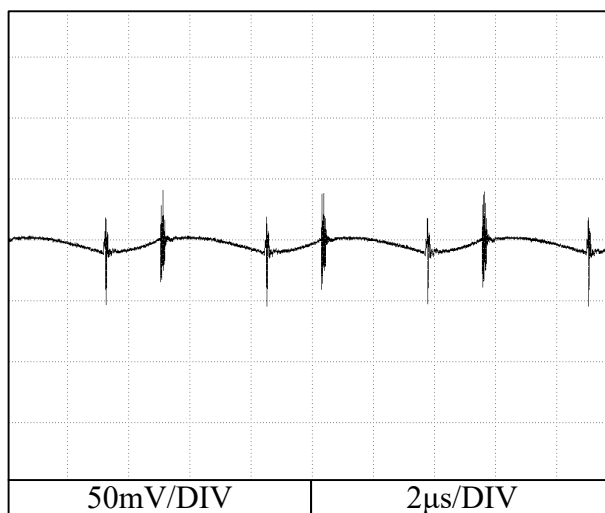
2-15. 出力リップル、ノイズ波形 Output ripple and noise waveform

Conditions Vin : 110VAC  
Iout : Full load  
Ta : 25°C

36V



57V



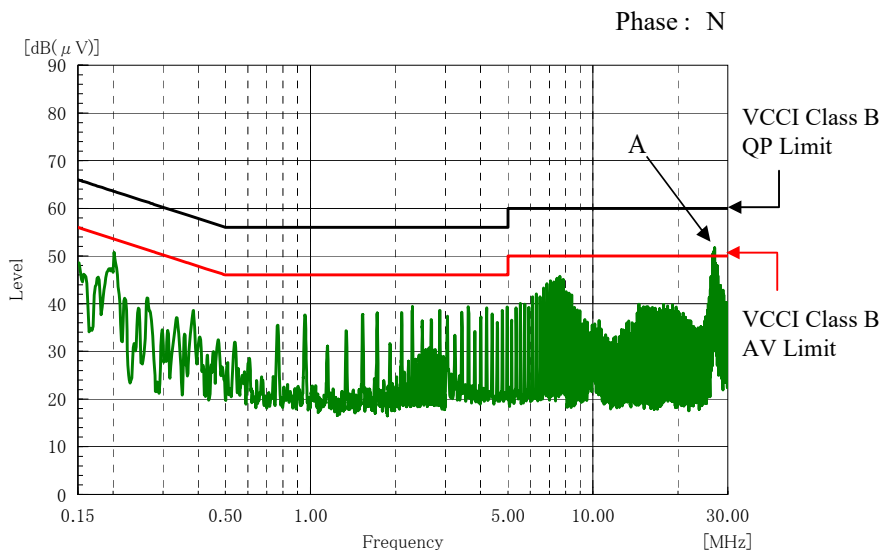
2-16. EMI特性 Electro-Magnetic Interference characteristics

Conditions Vin : 230VAC  
Iout : Full load  
Ta : 25°C

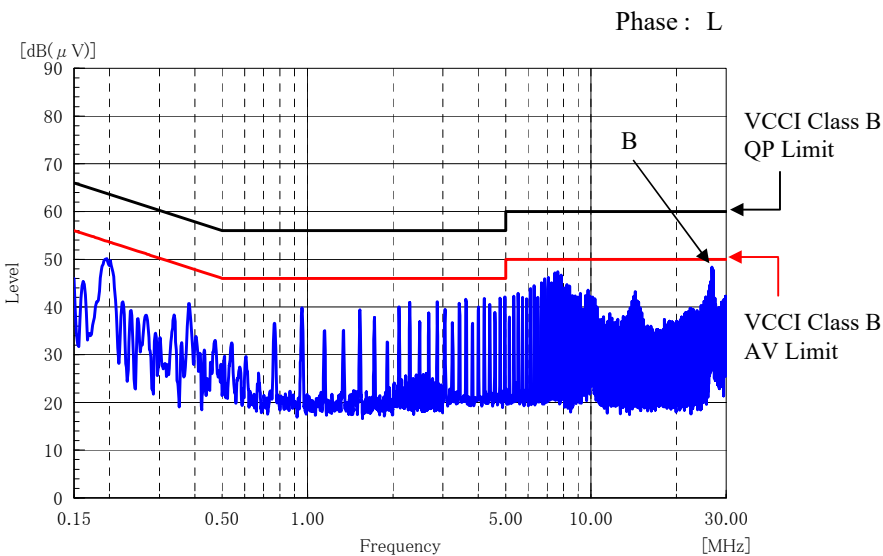
雑音端子電圧 Conducted Emission

36V

Point A (27.0MHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	60.0	49.3
AV	50.0	40.9



Point B (27.0MHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	60.0	45.6
AV	50.0	38.6



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.

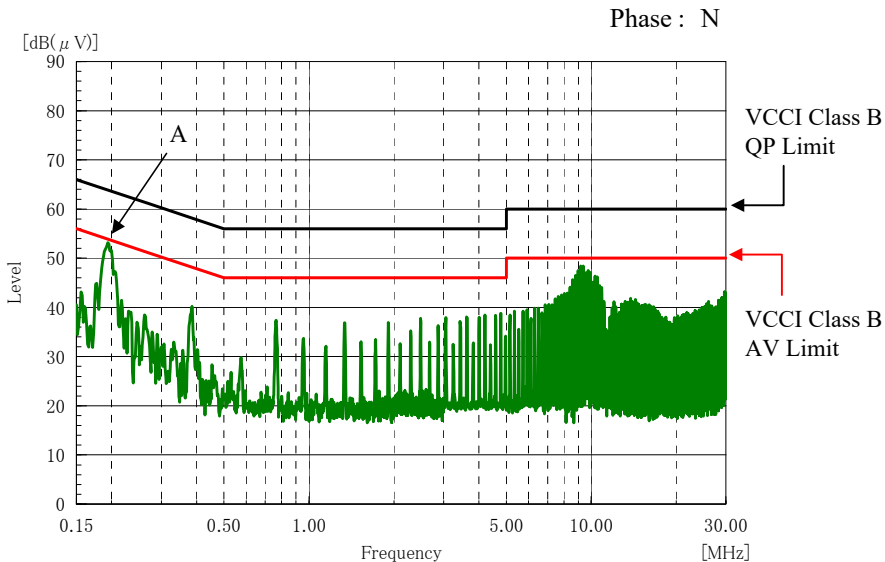
2-16. EMI特性 Electro-Magnetic Interference characteristics

Conditions Vin : 230VAC  
Iout : Full load  
Ta : 25°C

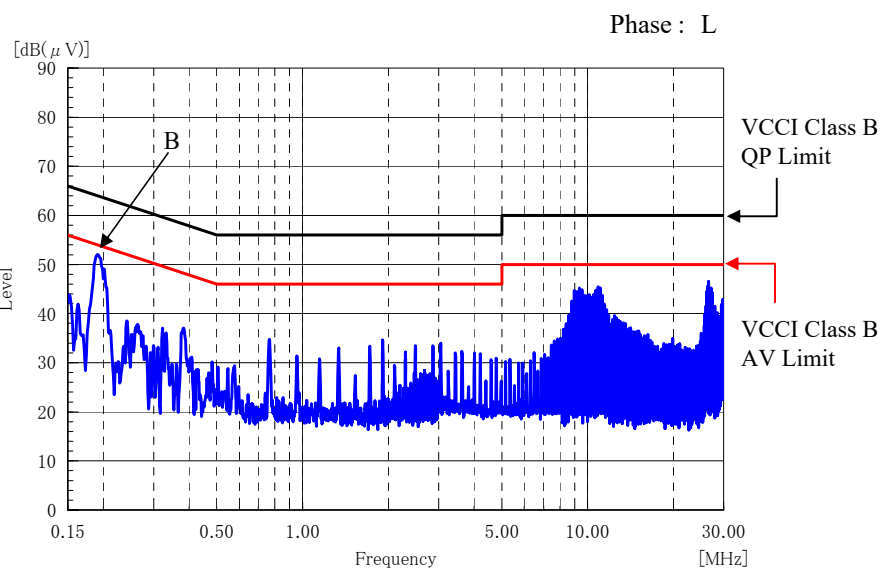
雑音端子電圧 Conducted Emission

57V

Point A (191kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	64.0	51.8
AV	54.0	49.6



Point B (192kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	64.0	51.1
AV	54.0	48.3



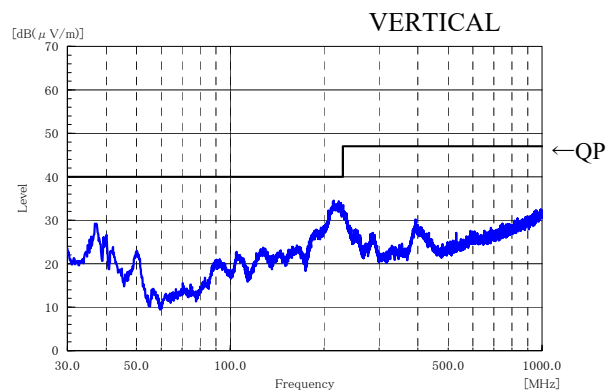
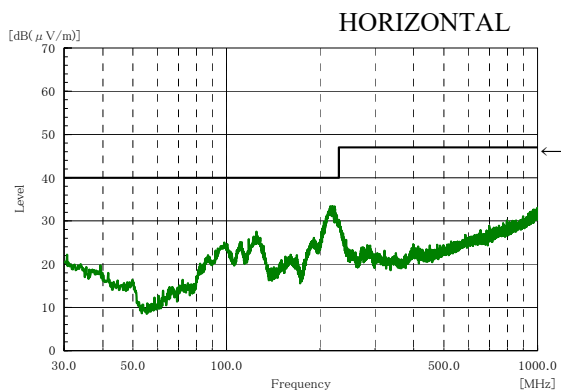
EN55011-B,EN55032-B,FCC-Bの限界値はVCCI class Bの限界値と同じ  
Limit of EN55011-B,EN55032-B,FCC-B are same as its VCCI class B.

2-16. EMI特性 Electro-Magnetic Interference characteristics

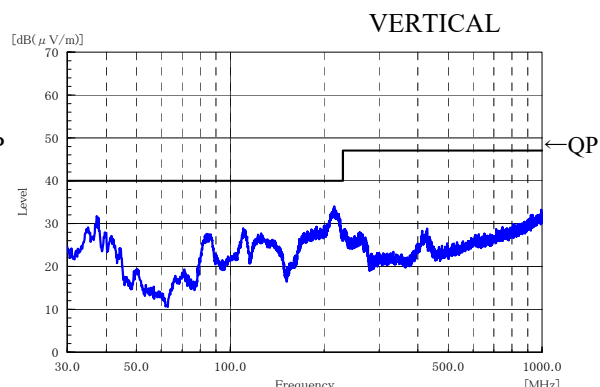
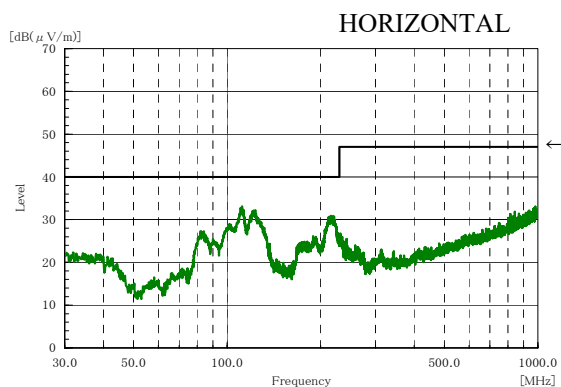
Conditions Vin : 230VAC  
Iout : Full load  
Ta : 25°C

雑音電界強度 Radiated Emission

36V



57V



測定条件は測定回路7を参照

Measurement condition refer Circuit 7 used for determination.

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.