

# **EVS300W**

# **EVALUATION DATA**

# 型式データ

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## 2. 特性データ Characteristics

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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<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

■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。

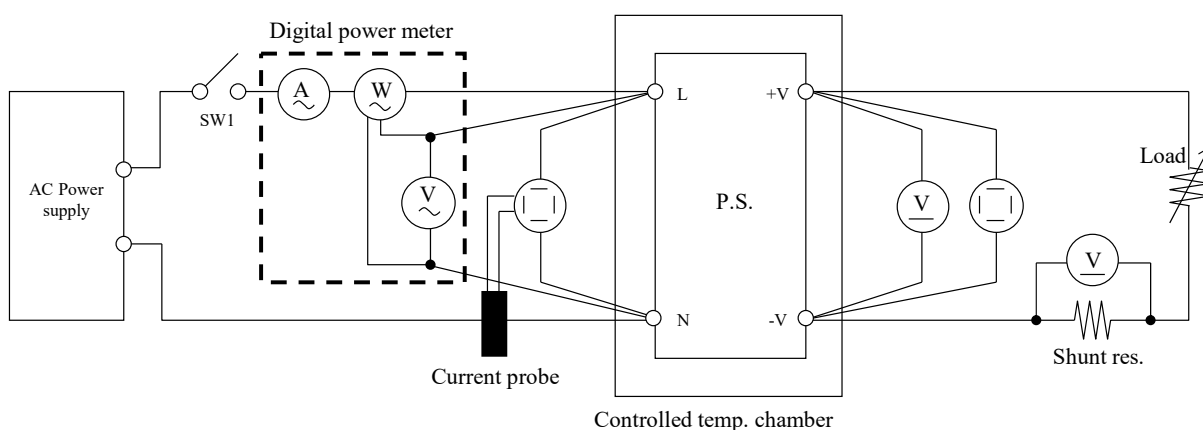
Test results are reference data based on our measurement condition.

# 1. 測定方法 Evaluation Method

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

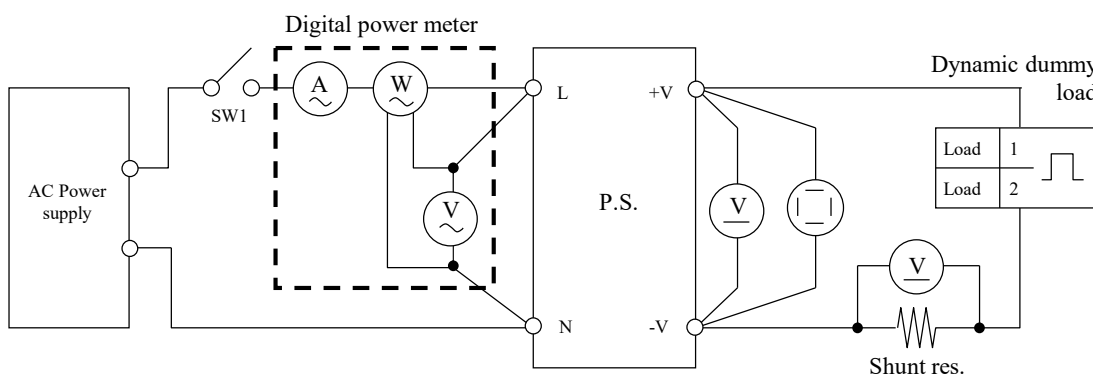
### 測定回路1 Circuit 1 used for determination

- 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

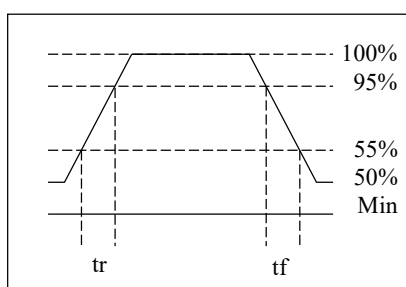


### 測定回路2 Circuit 2 used for determination

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

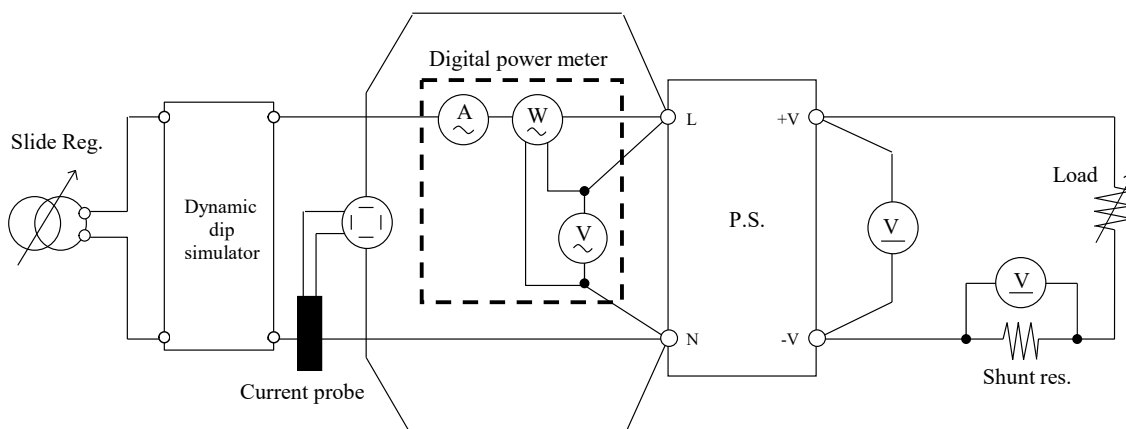


Output current waveform  
Iout 50%  $\rightleftharpoons$  100%



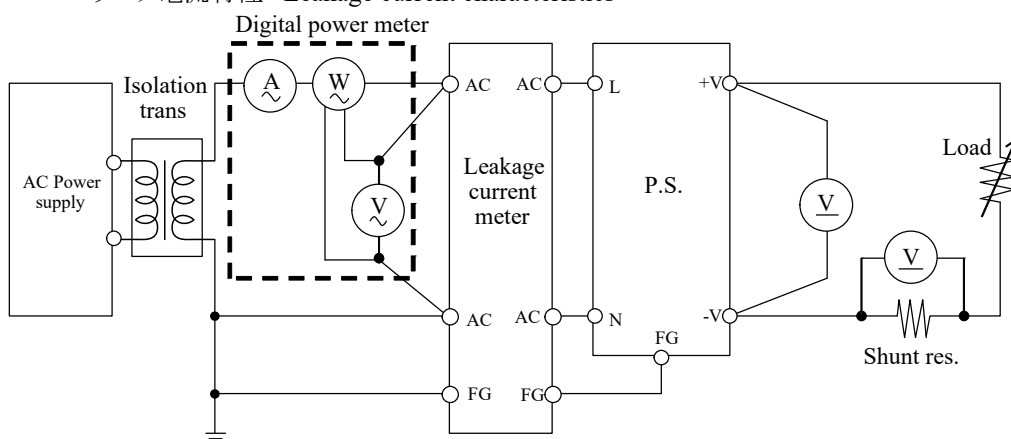
測定回路3 Circuit 3 used for determination

- 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

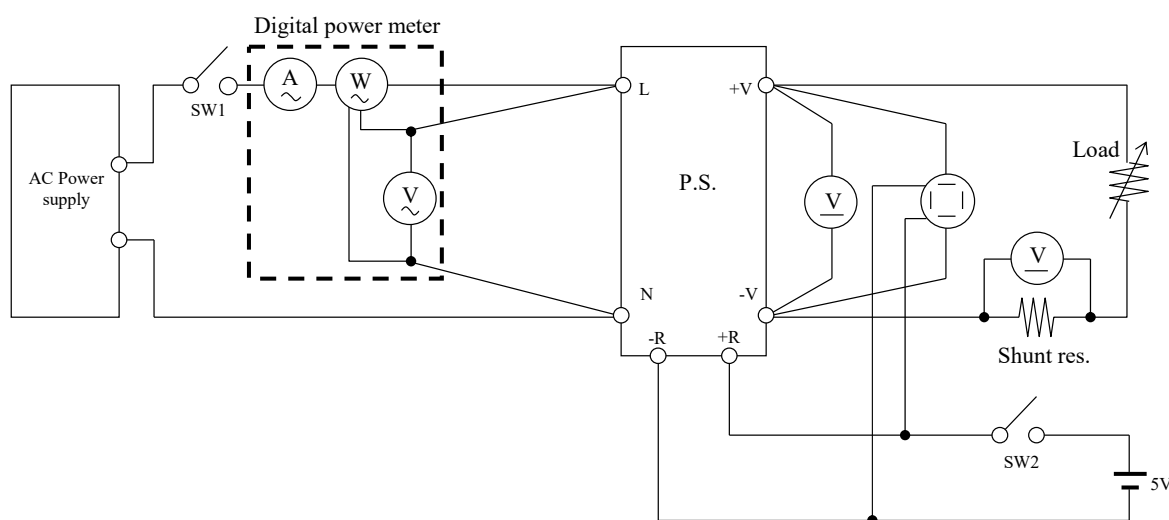
- リーク電流特性 Leakage current characteristics



測定回路5 Circuit 5 used for determination

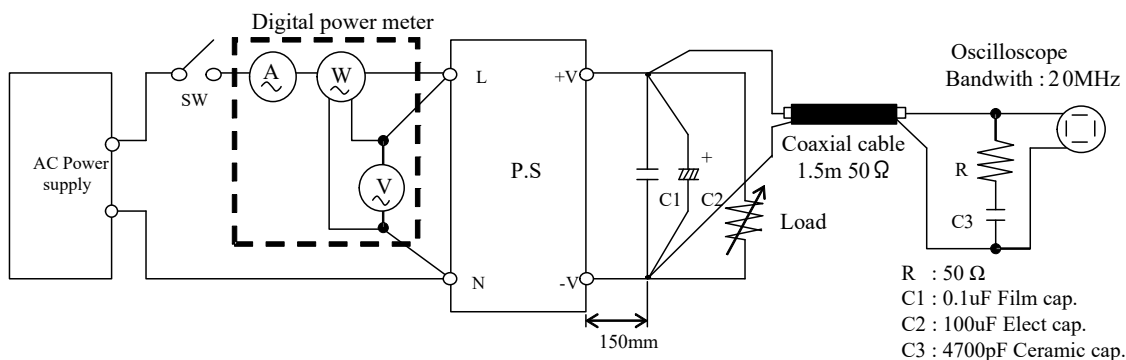
- ON/OFFコントロール時出力立ち上がり、立ち下がり特性  
Output rise, fall characteristics with ON/OFF Control

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



測定回路6 Circuit 6 used for determination

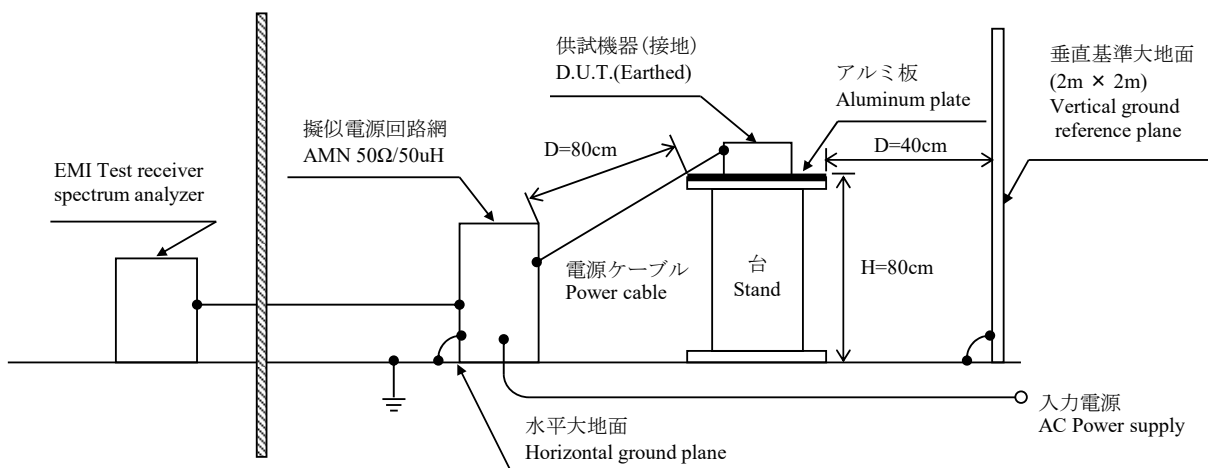
- 出力リップル、ノイズ波形 Output ripple and noise waveform



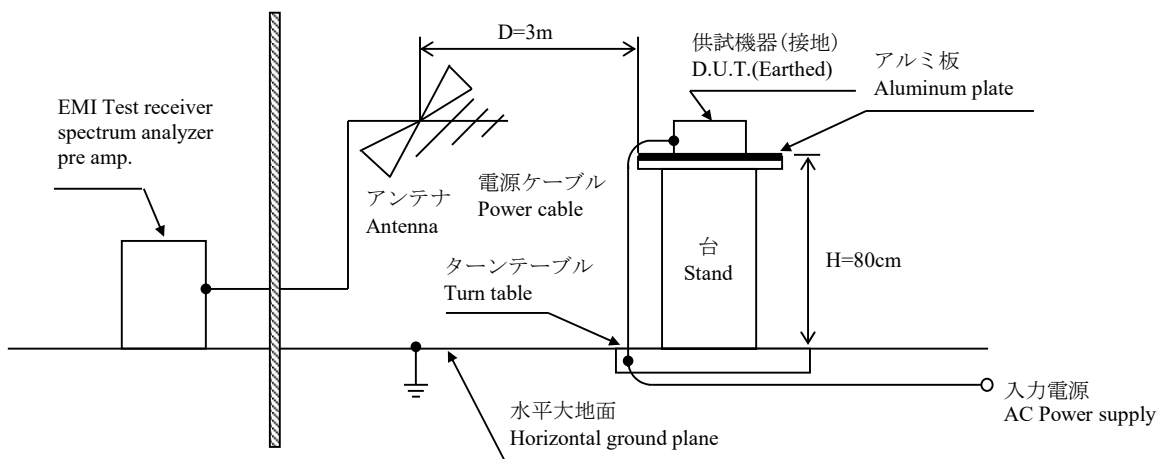
測定構成 Configuration used for determination

- 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-600L / 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90VAC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 90VAC.

Vin	Iout : Full load
90 - 265VAC	100%
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

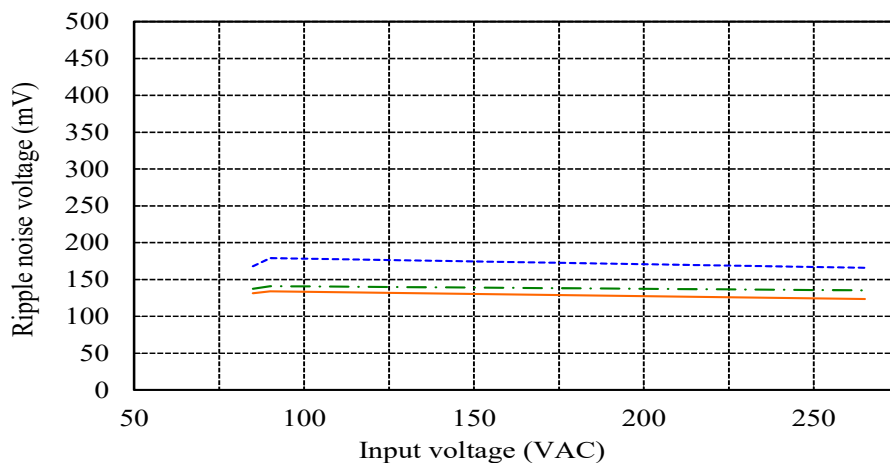
18V	1. Regulation - line and load					Condition Ta : 25 °C	
	Iout \ Vin	90VAC	100VAC	200VAC	265VAC	line regulation	
	0%	17.965V	17.965V	17.965V	17.965V	0mV	0.000%
	50%	17.955V	17.955V	17.955V	17.955V	0mV	0.000%
	100%	17.945V	17.945V	17.945V	17.945V	0mV	0.000%
	load	20mV	20mV	20mV	20mV		
	regulation	0.111%	0.111%	0.111%	0.111%		
	2. Temperature drift					Conditions Vin : 100 VAC Iout : 100 %	
	Ta	-20°C	+25°C	+45°C	temperature stability		
	Vout	17.910V	17.945V	17.952V	42mV	0.233%	
	3. Start up voltage and Drop out voltage					Conditions Ta : 25 °C Iout : 100 %	
	Start up voltage (Vin)	78VAC					
	Drop out voltage (Vin)	49VAC					
36V	1. Regulation - line and load					Condition Ta : 25 °C	
	Iout \ Vin	90VAC	100VAC	200VAC	265VAC	line regulation	
	0%	35.900V	35.900V	35.900V	35.900V	0mV	0.000%
	50%	35.893V	35.893V	35.894V	35.893V	1mV	0.003%
	100%	35.890V	35.890V	35.890V	35.890V	0mV	0.000%
	load	10mV	10mV	10mV	10mV		
	regulation	0.028%	0.028%	0.028%	0.028%		
	2. Temperature drift					Conditions Vin : 100 VAC Iout : 100 %	
	Ta	-20°C	+25°C	+45°C	temperature stability		
	Vout	35.772V	35.890V	35.835V	118mV	0.328%	
	3. Start up voltage and Drop out voltage					Conditions Ta : 25 °C Iout : 100 %	
	Start up voltage (Vin)	78VAC					
	Drop out voltage (Vin)	54VAC					
57V	1. Regulation - line and load					Condition Ta : 25 °C	
	Iout \ Vin	90VAC	100VAC	200VAC	265VAC	line regulation	
	0%	56.992V	56.992V	56.992V	56.992V	0mV	0.000%
	50%	56.988V	56.987V	56.987V	56.987V	1mV	0.002%
	100%	56.986V	56.986V	56.986V	56.986V	0mV	0.000%
	load	6mV	6mV	6mV	6mV		
	regulation	0.011%	0.011%	0.011%	0.011%		
	2. Temperature drift					Conditions Vin : 100 VAC Iout : 100 %	
	Ta	-20°C	+25°C	+45°C	temperature stability		
	Vout	56.874V	56.986V	56.938V	112mV	0.196%	
	3. Start up voltage and Drop out voltage					Conditions Ta : 25 °C Iout : 100 %	
	Start up voltage (Vin)	78VAC					
	Drop out voltage (Vin)	51VAC					



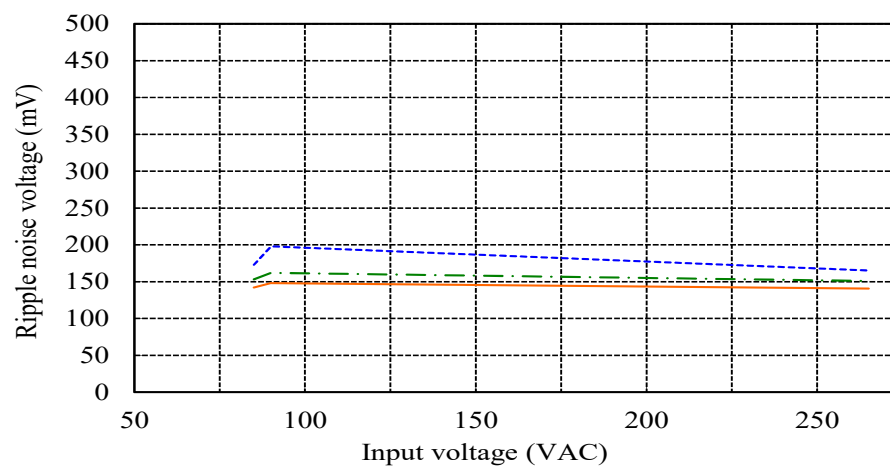
(2) リップルノイズ電圧対入力電圧 Ripple noise voltage vs. Input voltage

Conditions Iout: 100%  
 Ta : -20°C ---  
 25°C - - -  
 45°C ———

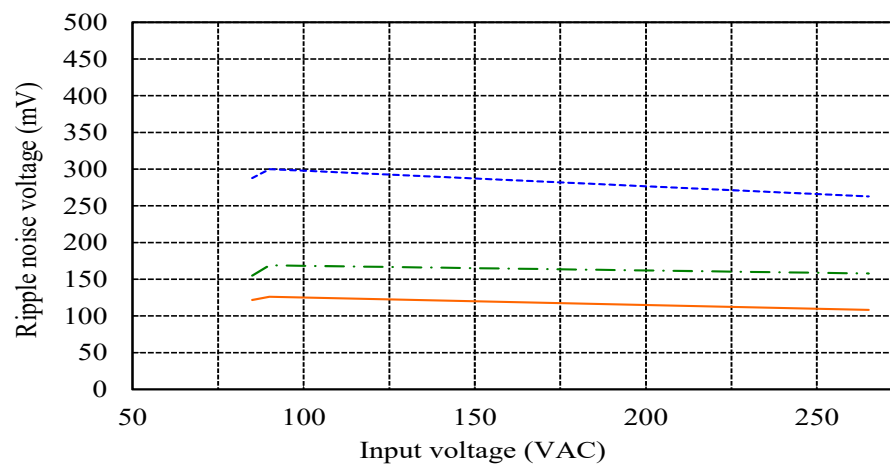
18V



36V



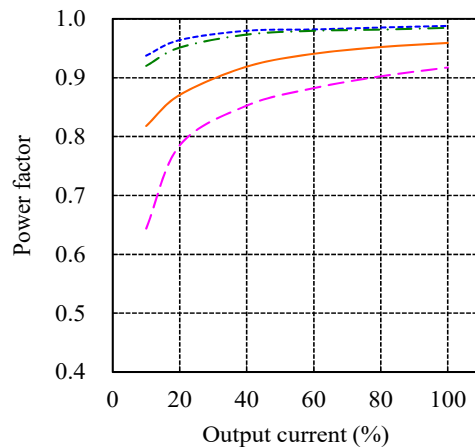
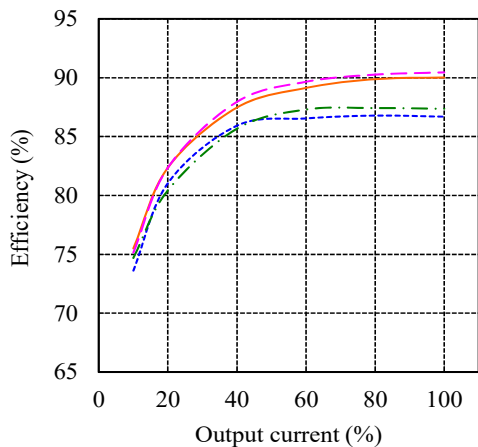
57V



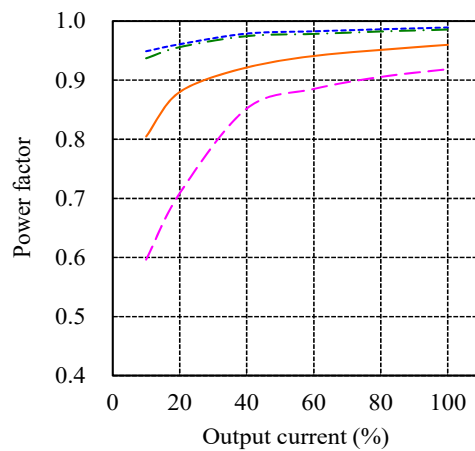
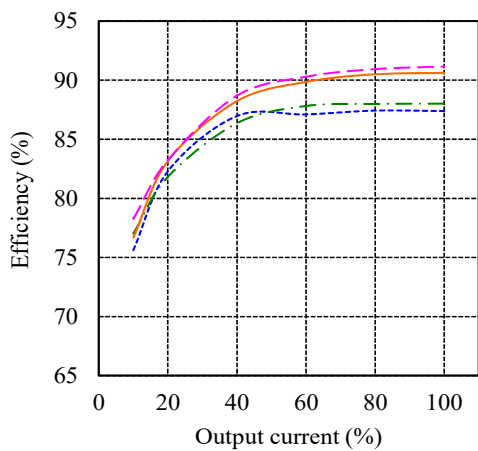
(3) 効率・力率対出力電流 Efficiency and Power factor vs. Output current

Conditions Vin : 90VAC ---  
 100VAC - - -  
 200VAC ---  
 265VAC - - -  
 Ta : 25°C

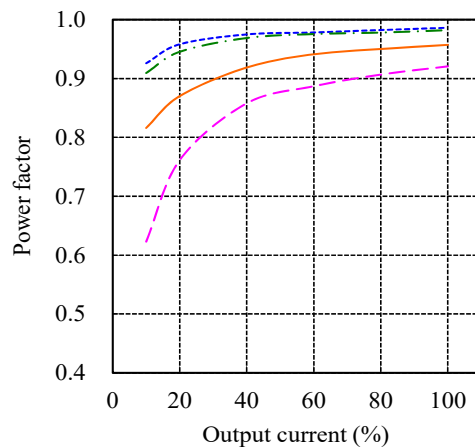
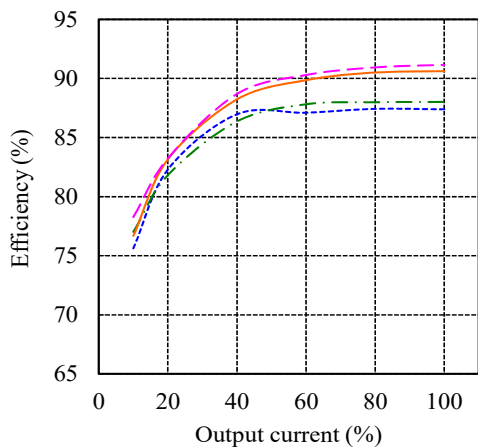
18V



36V



57V

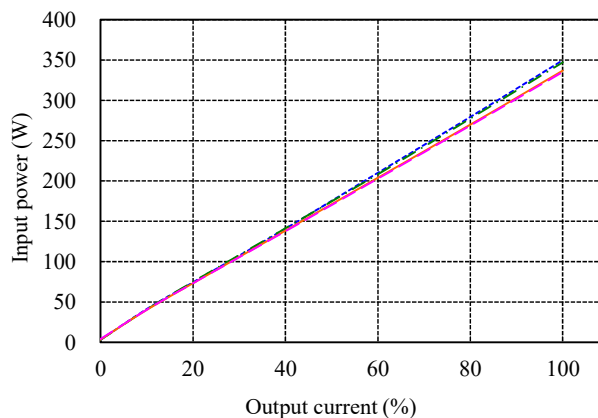


(4) 入力電力対出力電流 Input power vs. Output current

Conditions Vin : 90VAC ---  
 100VAC - - -  
 200VAC ---  
 265VAC - - -  
 Ta : 25°C

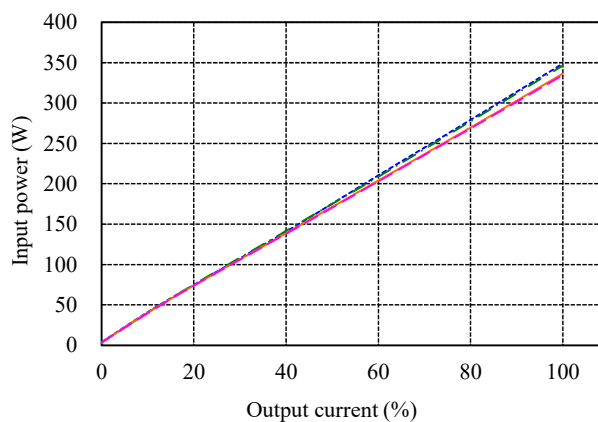
18V

Vin	Input power
	Iout : 0%
90VAC	3.1W
100VAC	3.2W
200VAC	3.4W
265VAC	4.2W



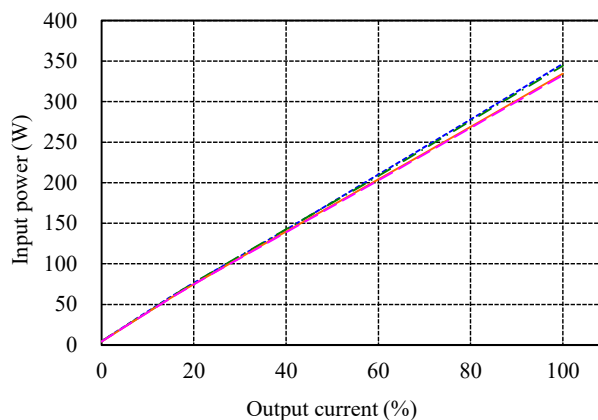
36V

Vin	Input power
	Iout : 0%
90VAC	3.8W
100VAC	3.9W
200VAC	3.3W
265VAC	3.5W



57V

Vin	Input power
	Iout : 0%
90VAC	4.6W
100VAC	4.8W
200VAC	4.2W
265VAC	4.4W

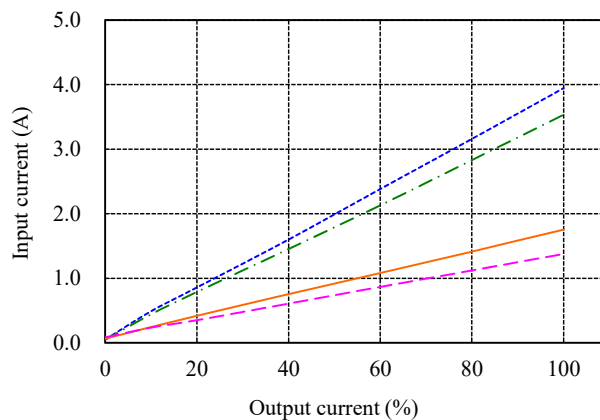


(5) 入力電流対出力電流 Input current vs. Output current

Conditions Vin : 90VAC ---  
 100VAC - - -  
 200VAC ———  
 265VAC - · - ·  
 Ta : 25°C

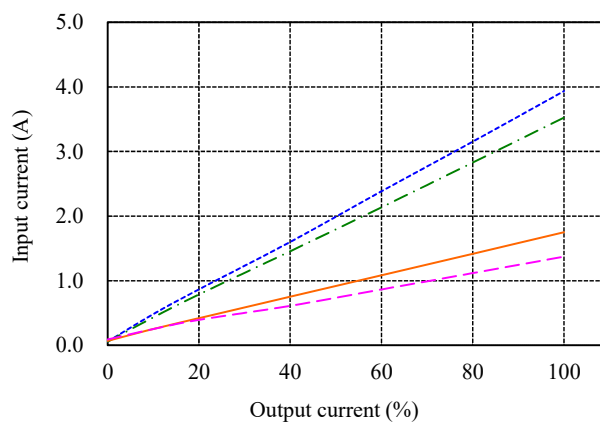
18V

Vin	Input current
	Iout : 0%
90VAC	0.05A
100VAC	0.05A
200VAC	0.07A
265VAC	0.09A



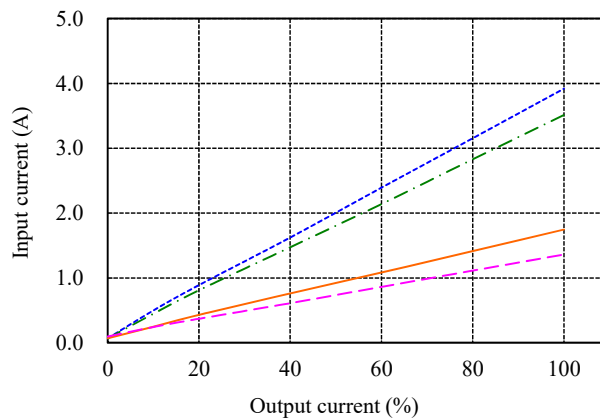
36V

Vin	Input current
	Iout : 0%
90VAC	0.06A
100VAC	0.06A
200VAC	0.07A
265VAC	0.09A



57V

Vin	Input current
	Iout : 0%
90VAC	0.07A
100VAC	0.07A
200VAC	0.07A
265VAC	0.10A

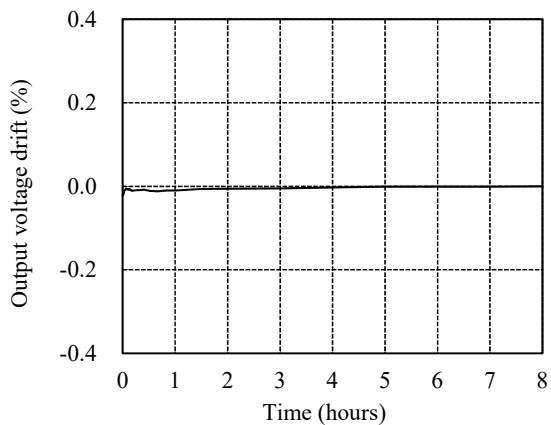


2-2. 通電ドリフト特性

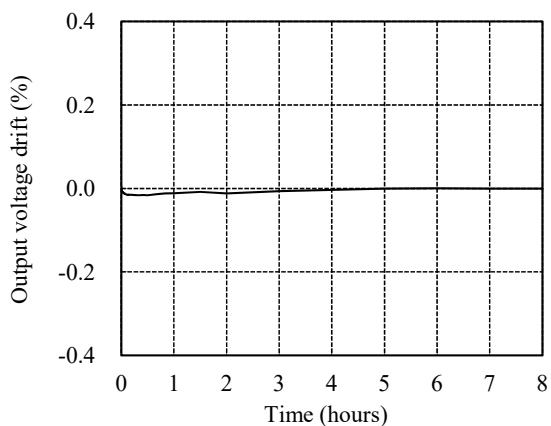
Warm up voltage drift characteristics

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

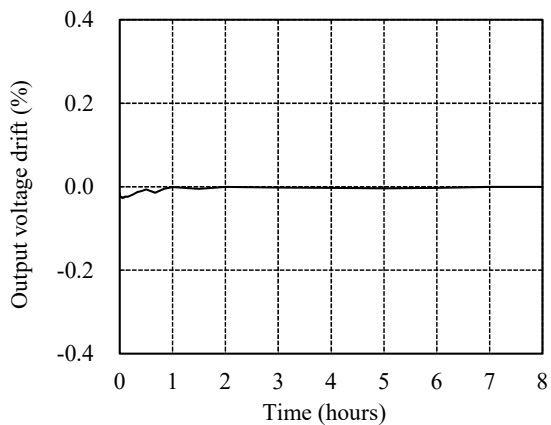
18V



36V



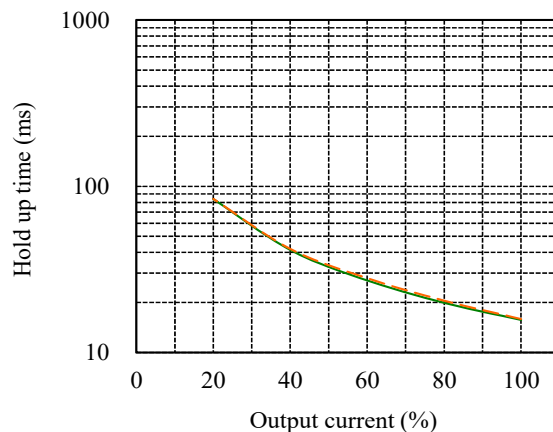
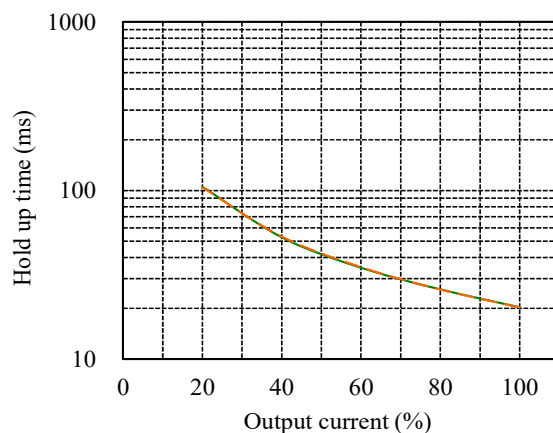
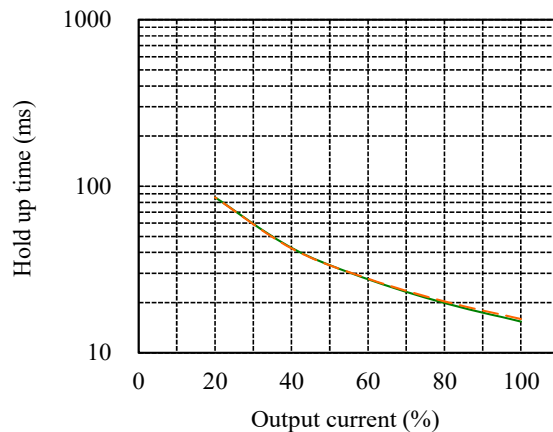
57V



2-3. 出力保持時間特性

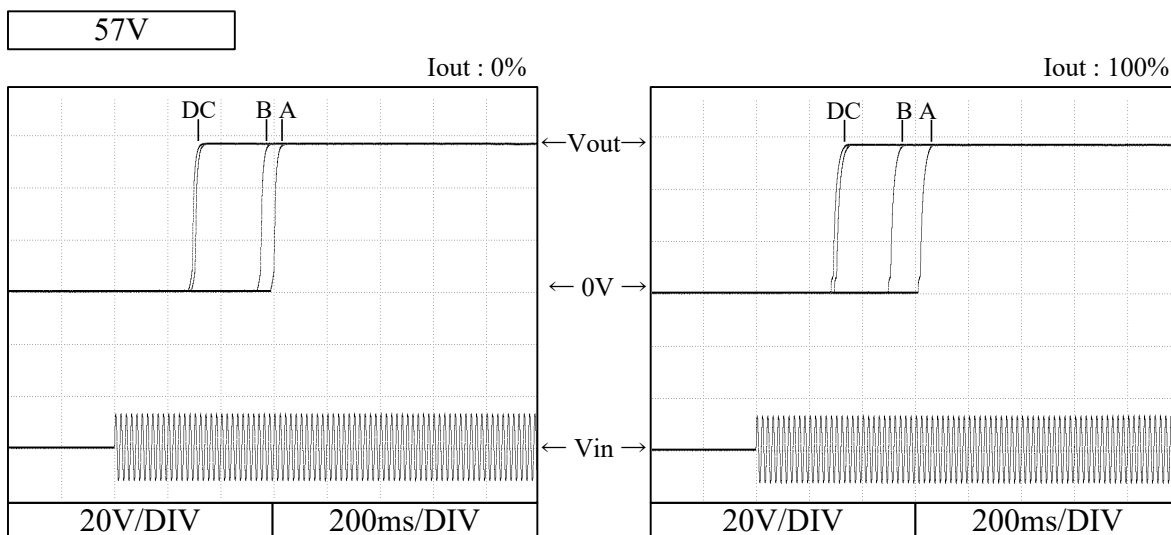
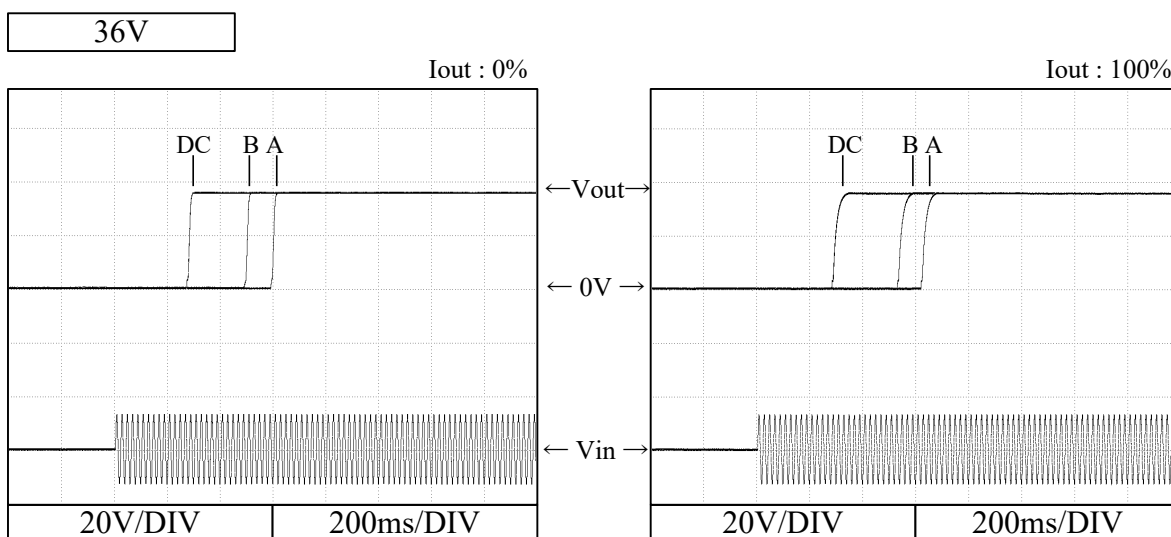
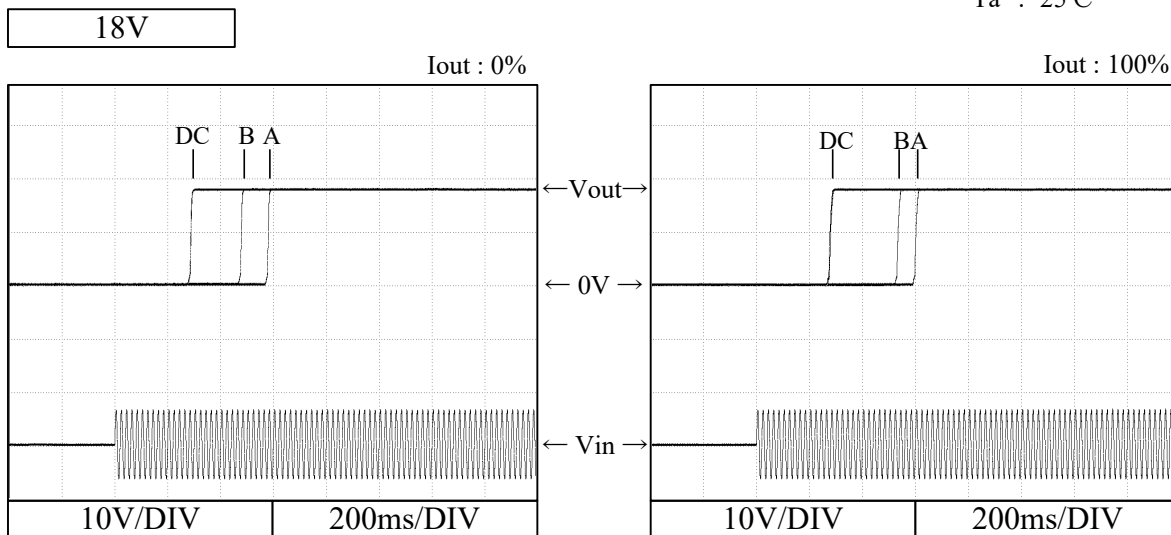
Hold up time characteristics

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



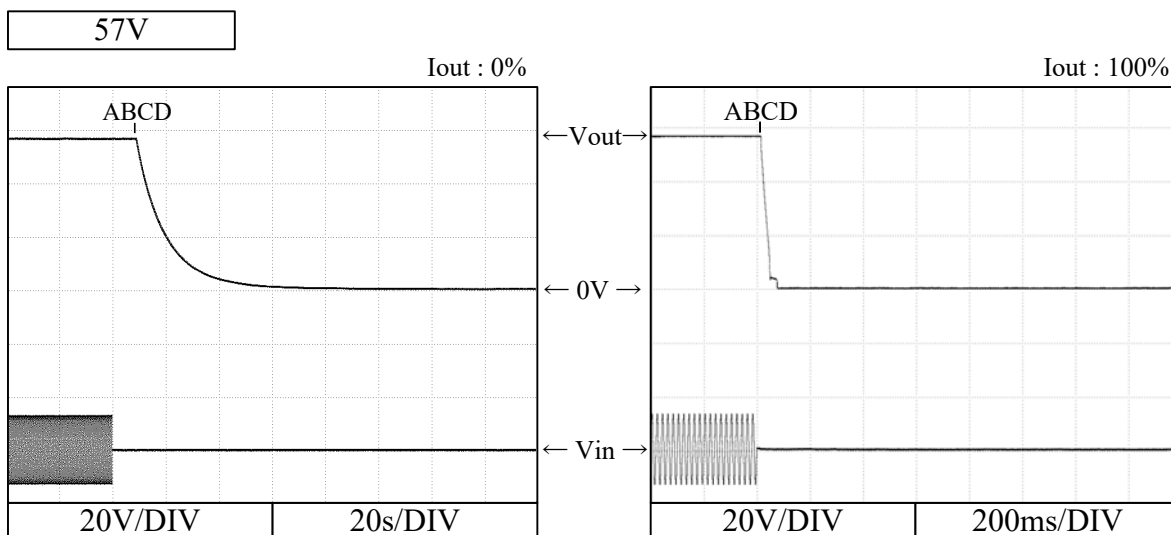
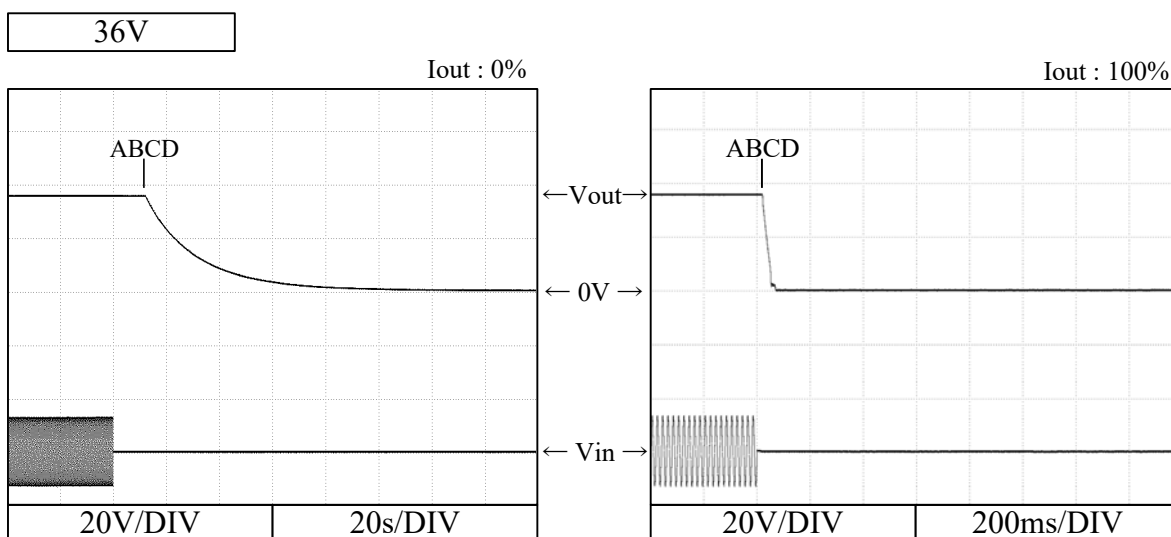
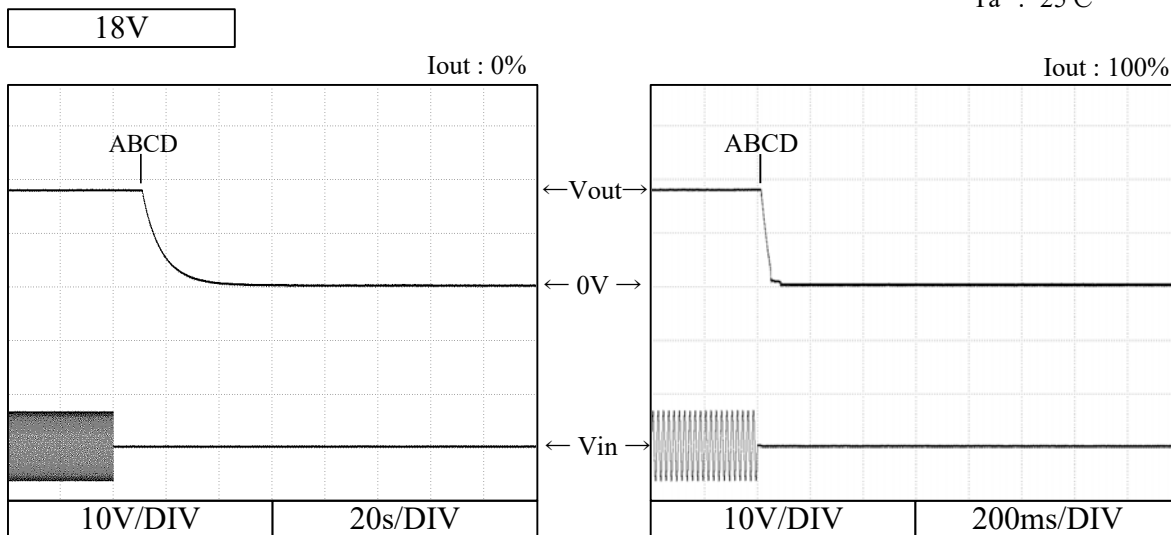
2-4. 出力立ち上がり特性 Output rise characteristics

Conditions Vin : 90VAC (A)  
 : 100VAC (B)  
 : 200VAC (C)  
 : 265VAC (D)  
 Ta : 25°C



2-5. 出力立ち下がり特性 Output fall characteristics

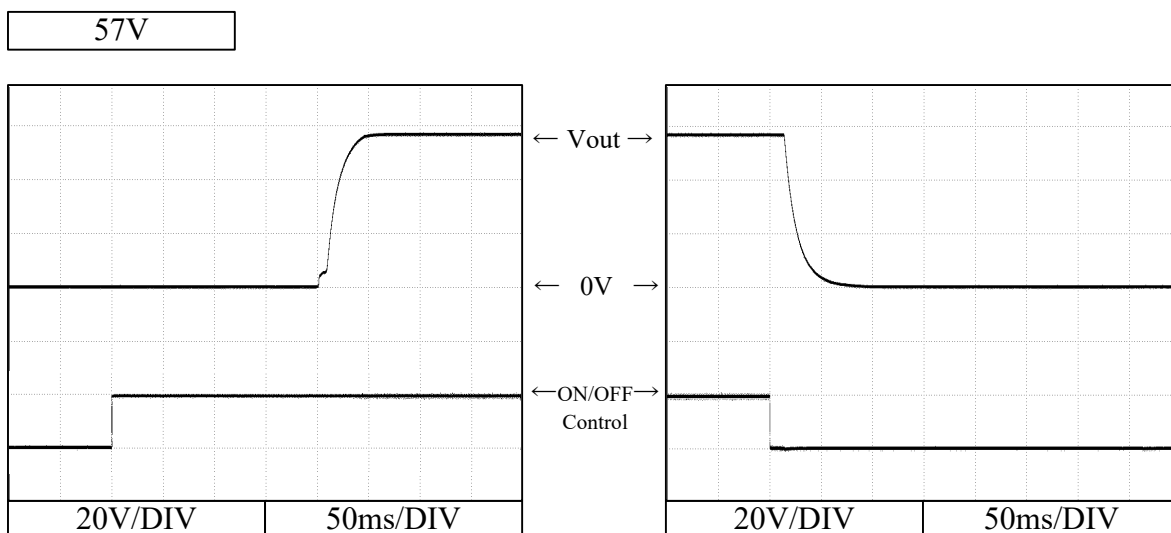
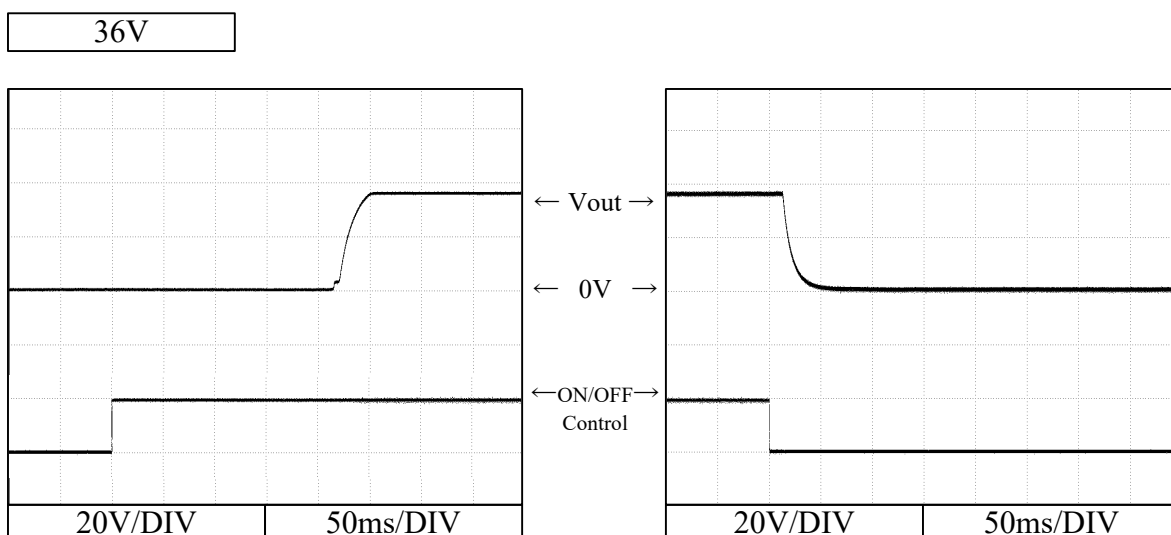
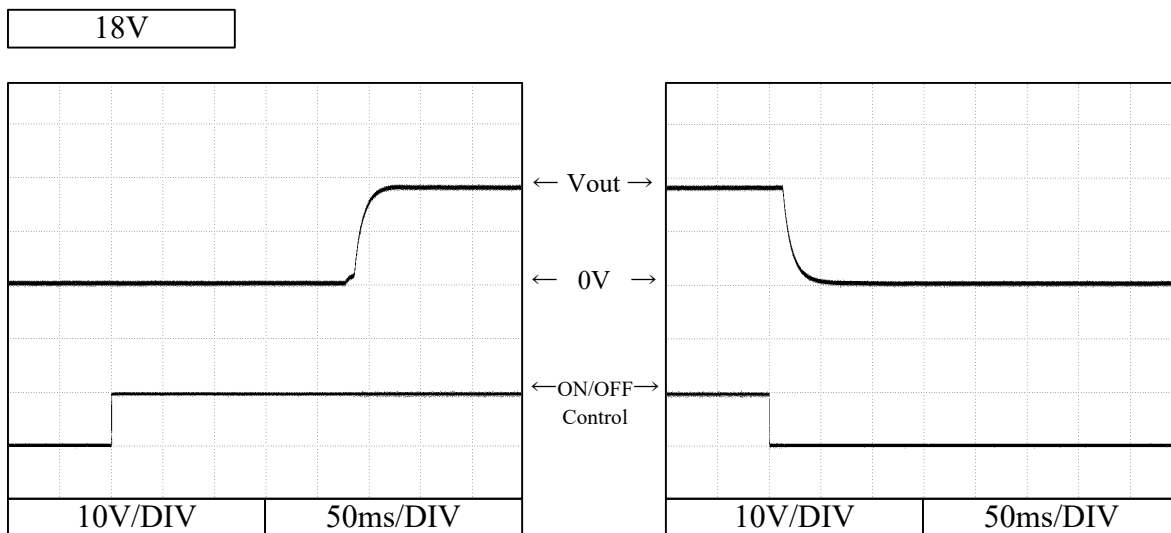
Conditions Vin : 90VAC (A)  
          : 100VAC (B)  
          : 200VAC (C)  
          : 265VAC (D)  
Ta : 25°C



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 : 100VAC  
Iout : 100%  
Ta : 25°C





2-7. 出力電流対出力電圧特性

Output current vs. Output voltage characteristics

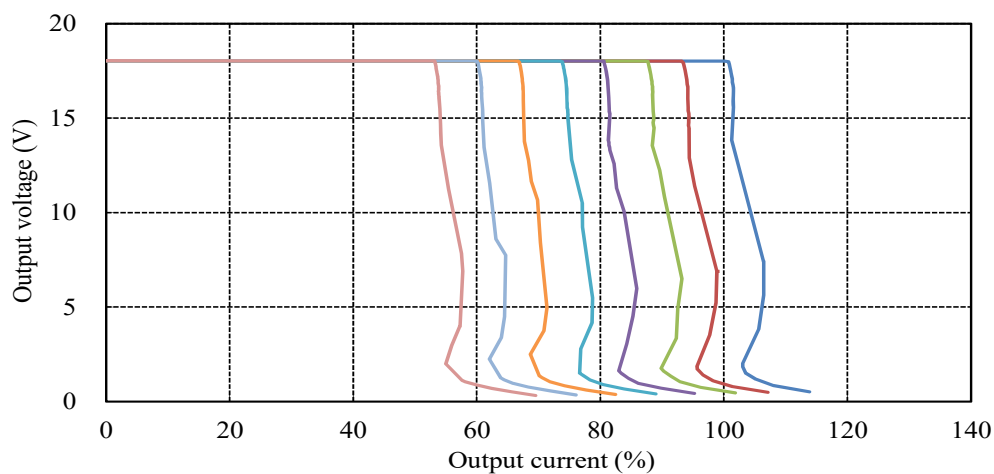
Conditions Vin : 100VAC

Vo setting 18V

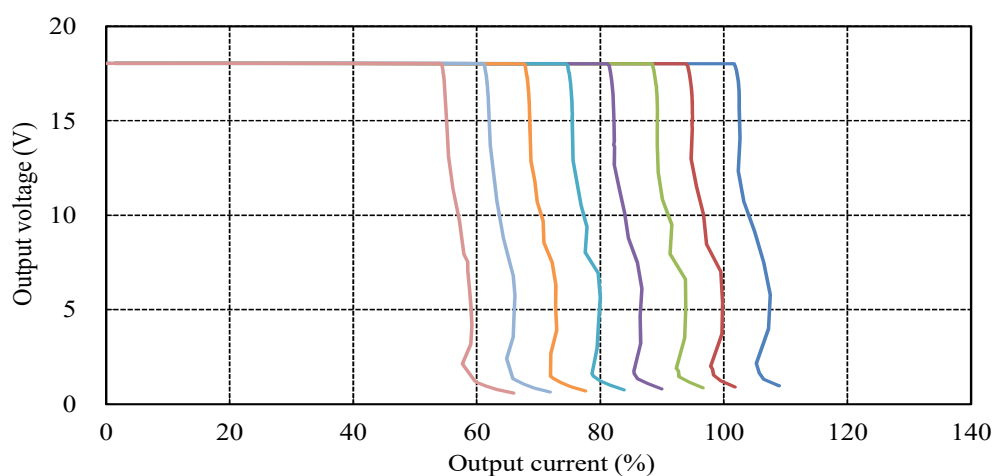
C.C. Rotary Switch Position : No.2 No.6  
 No.3 No.7  
 No.4 No.8  
 No.5 No.9

18V

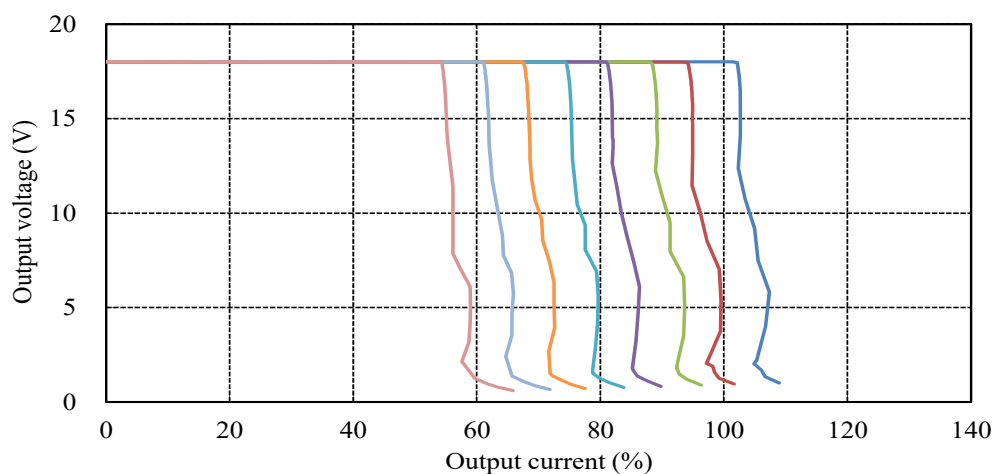
Ta : -20 °C



Ta : 25°C



Ta : 45°C



2-7. 出力電流対出力電圧特性

Output current vs. Output voltage characteristics

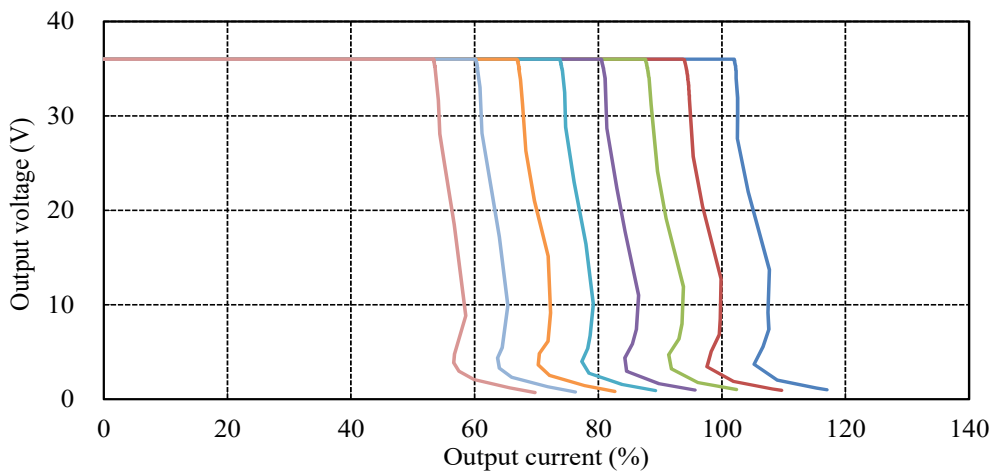
Conditions Vin : 100VAC

Vo setting 36V

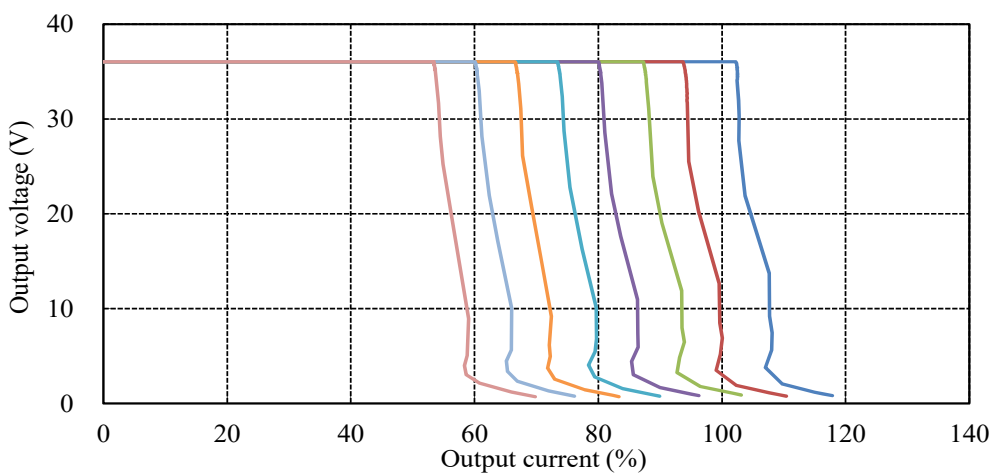
C.C. Rotary Switch Position : No.2 No.6  
 No.3 No.7  
 No.4 No.8  
 No.5 No.9

36V

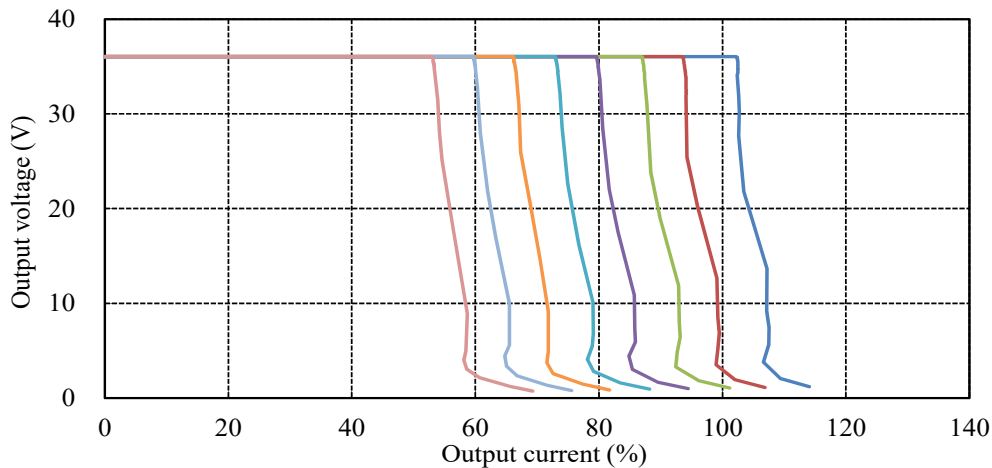
Ta : -20 °C



Ta : 25 °C



Ta : 45 °C



2-7. 出力電流対出力電圧特性

Output current vs. Output voltage characteristics

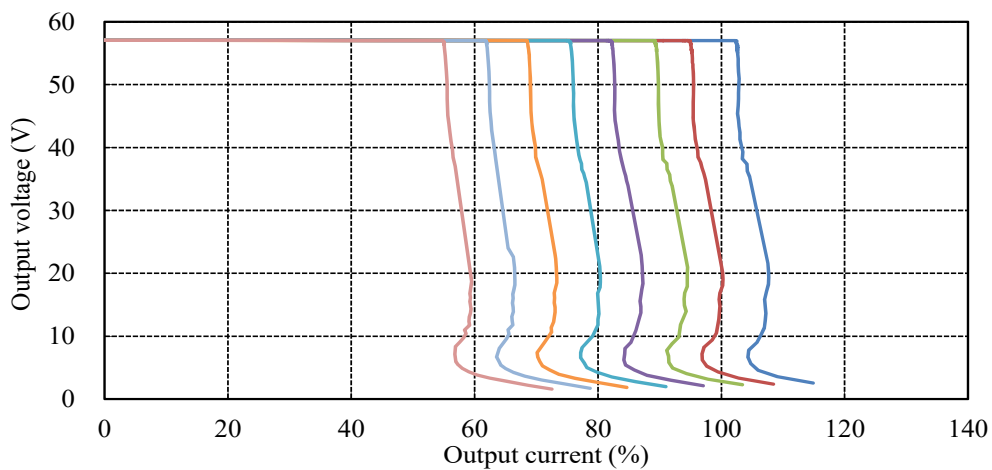
Conditions Vin : 100VAC

Vo setting 57V

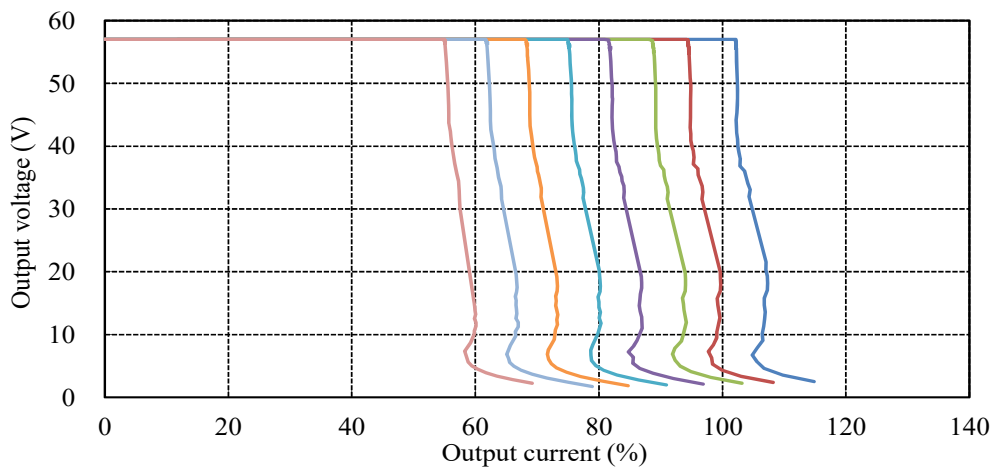
C.C. Rotary Switch Position : No.2 No.6  
 No.3 No.7  
 No.4 No.8  
 No.5 No.9

57V

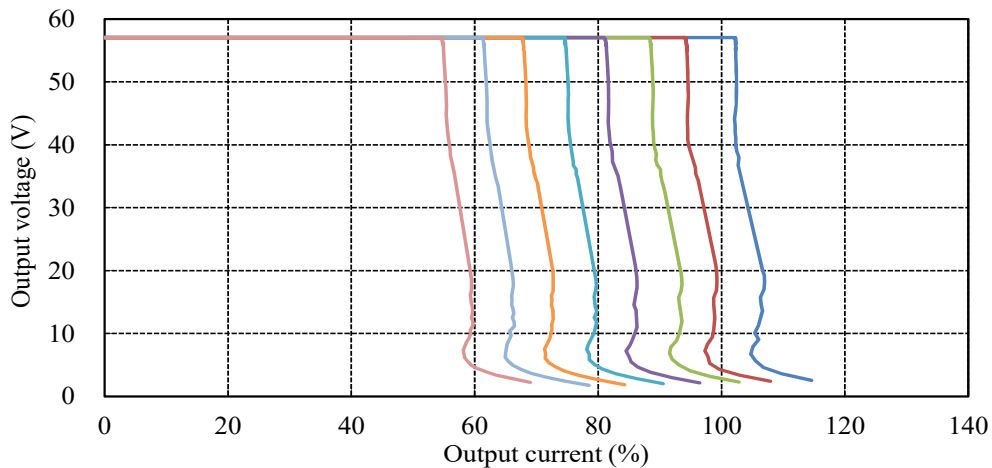
Ta : -20 °C



Ta : 25°C



Ta : 45°C



2-8. 過電圧保護特性

Over voltage protection (OVP) characteristics

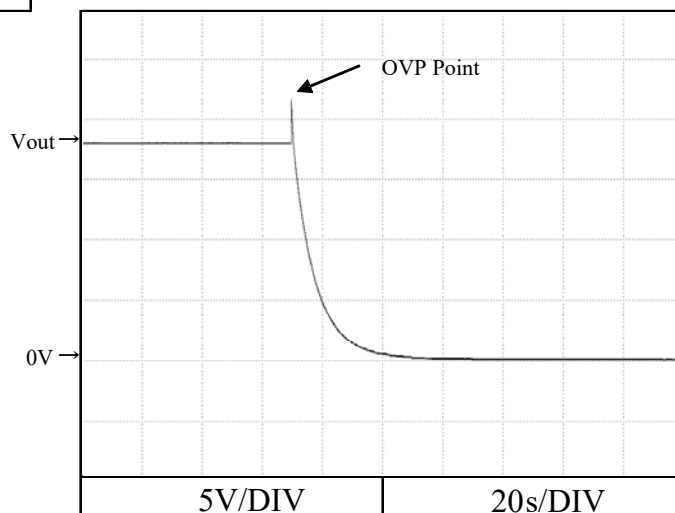
Conditions

Vin : 100VAC

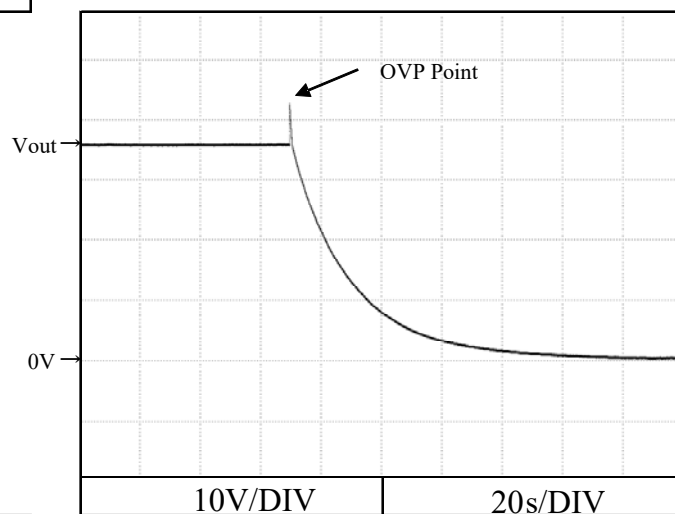
Iout : 0%

Ta : 25°C

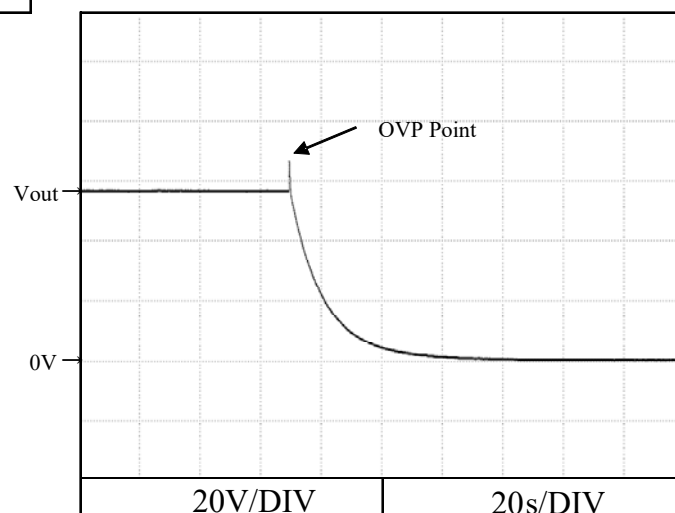
18V



36V



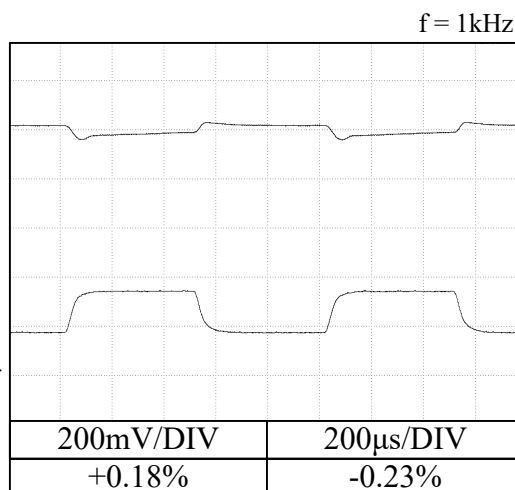
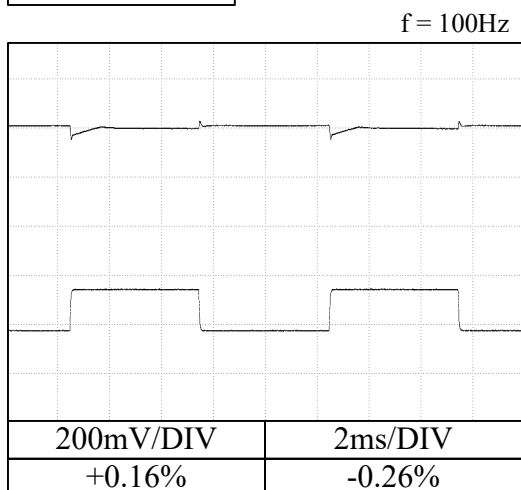
57V



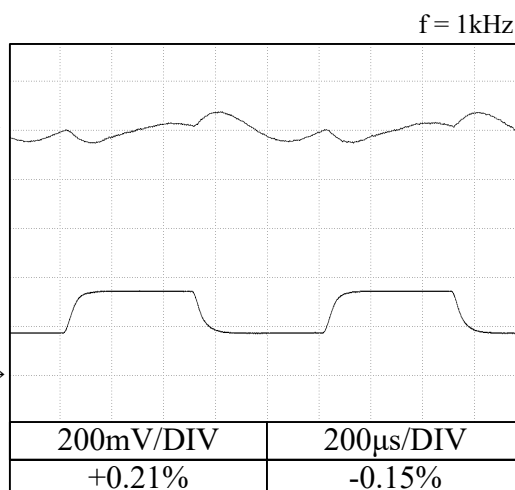
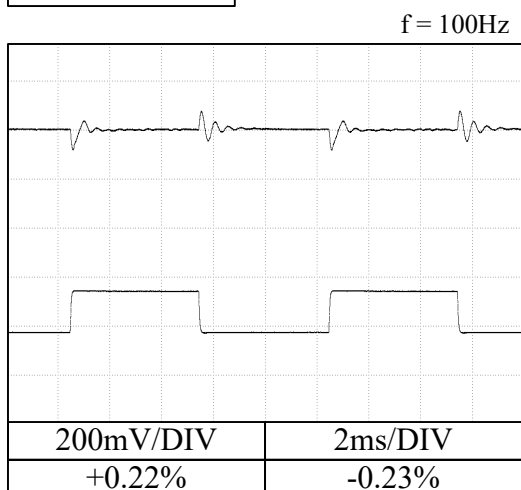
2-9. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions  $V_{in}$  : 100VAC  
 $I_{out}$  : 50% $\leftrightarrow$ 100%  
 ( $t_r = t_f = 50\mu s$ )  
 $T_a$  : 25°C

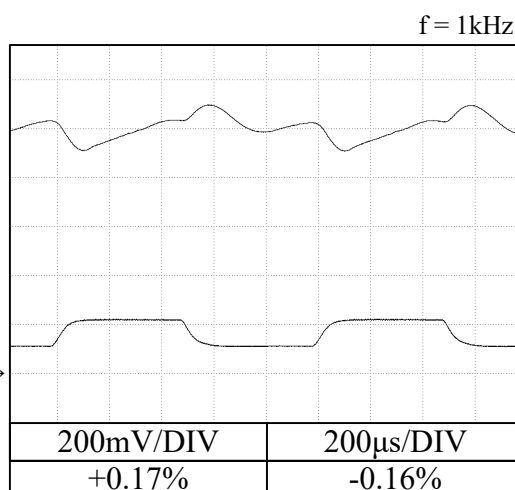
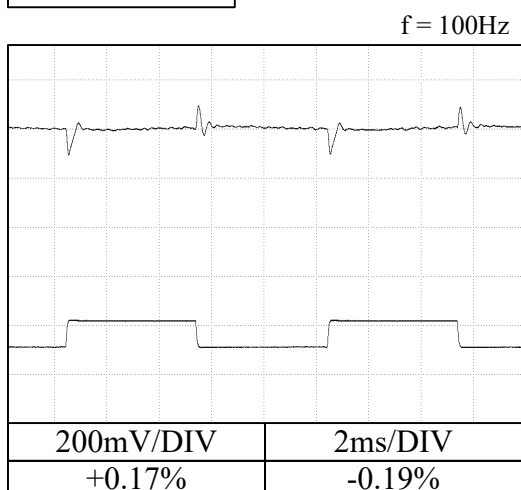
18V



36V



57V



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

Conditions Iout : 100%

Ta : 25°C

瞬停時間 Interruption time

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

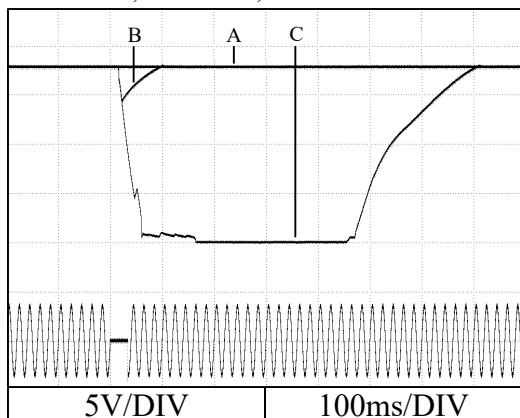
B : 出力電圧が20% - 40%低下 Output voltage to drop down to 20 - 40 %.

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

18V

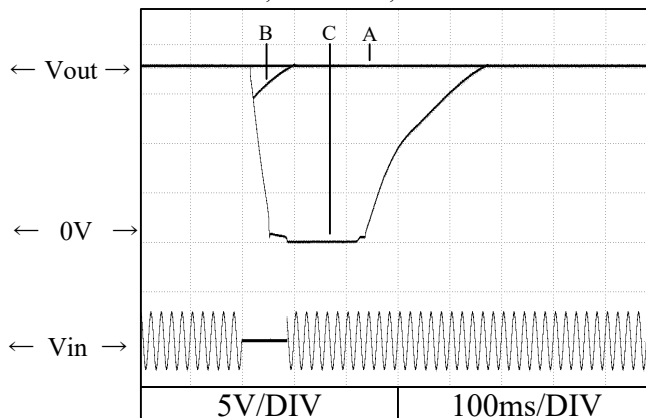
Vin : 100VAC

A = 15ms , B = 22ms , C = 34ms



Vin : 200VAC

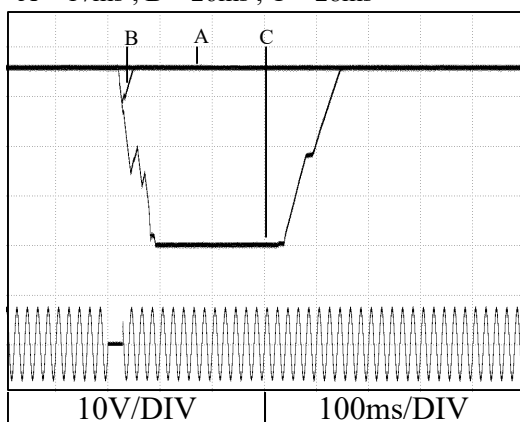
A = 15ms , B = 22ms , C = 87ms



36V

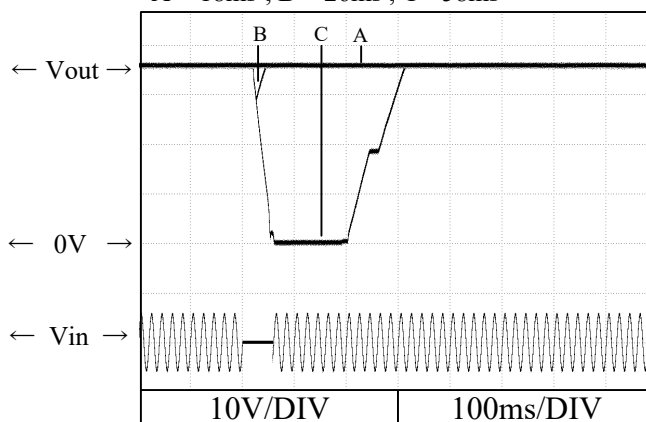
Vin : 100VAC

A = 17ms , B = 26ms , C = 28ms



Vin : 200VAC

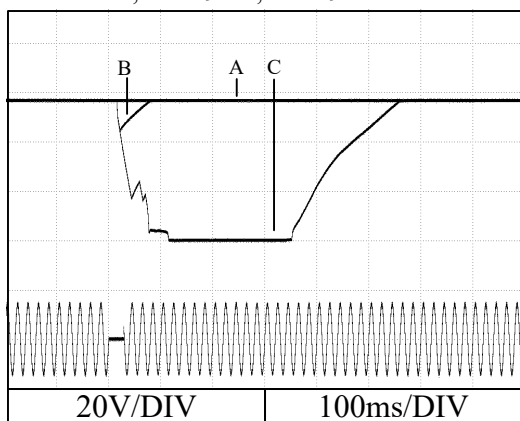
A = 18ms , B = 26ms , C = 58ms



57V

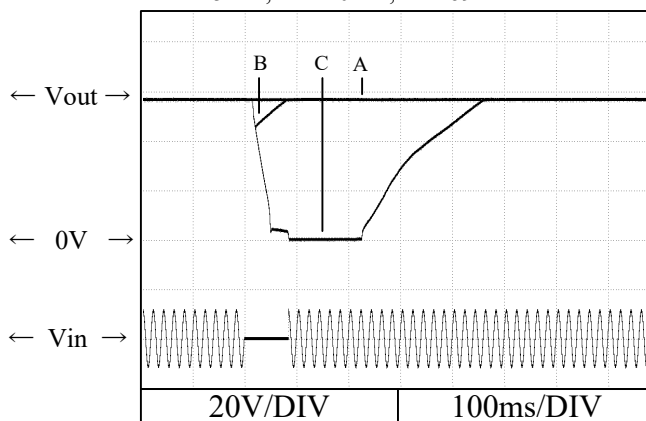
Vin : 100VAC

A = 14ms , B = 19ms , C = 29ms



Vin : 200VAC

A = 15ms , B = 20ms , C = 69ms

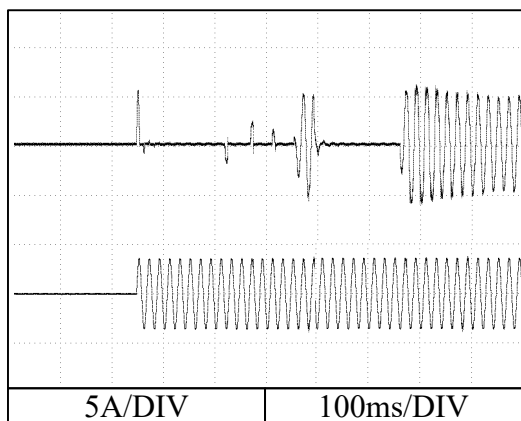


2-11. 入力サージ電流(突入電流)波形 Inrush current waveform

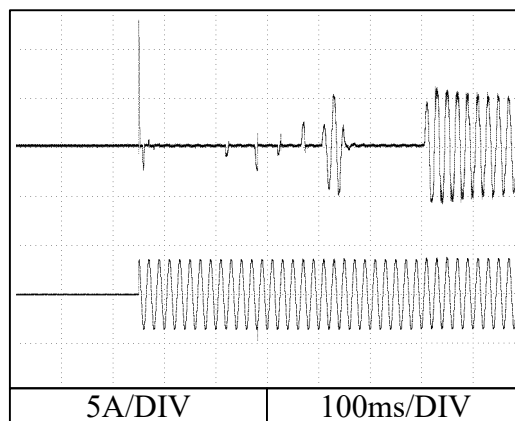
57V

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

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

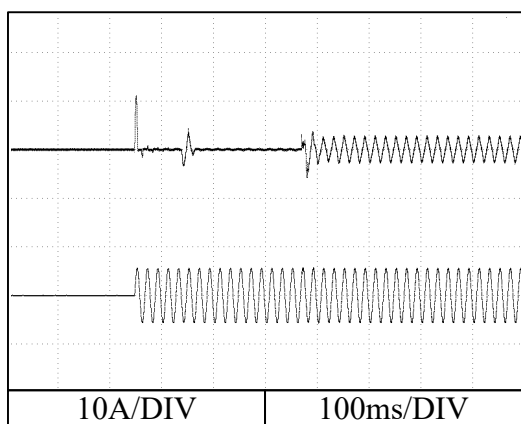


Switch on phase angle of input AC voltage  
 $\phi = 90^\circ$

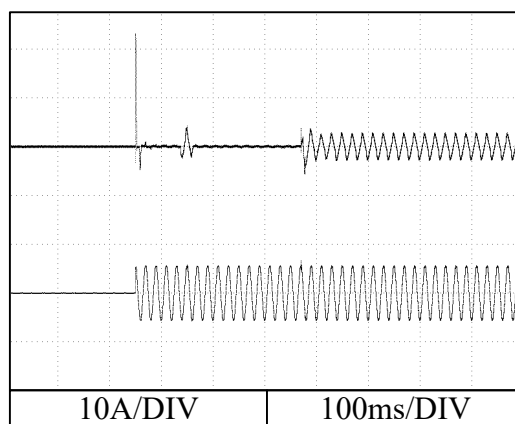


Conditions Vin : 200VAC  
Iout : 100%  
Ta : 25°C

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



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

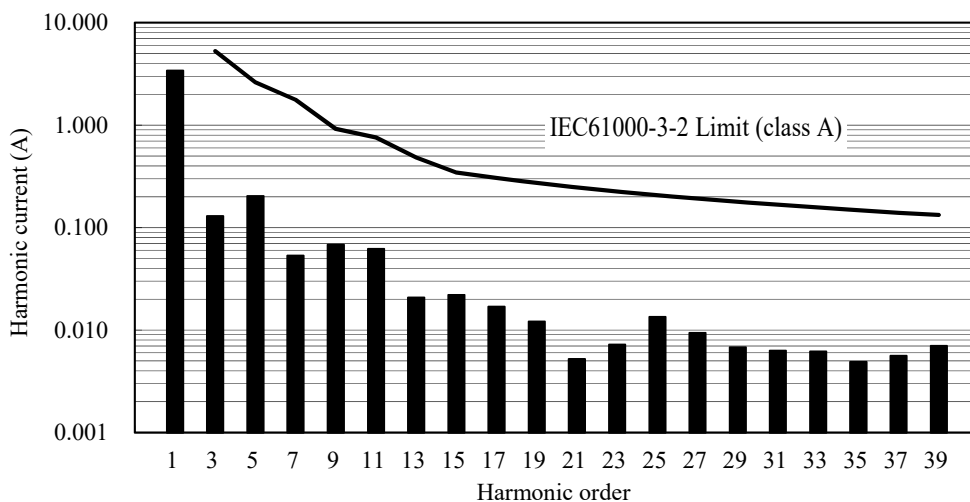


2-12. 高調波成分 Input current harmonics

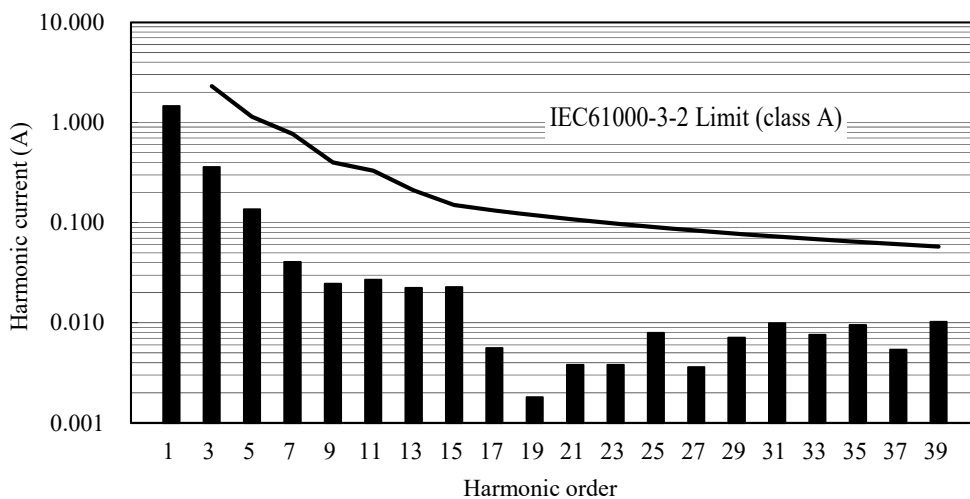
Conditions Iout: 100%  
Ta : 25°C

18V

Vin : 100VAC



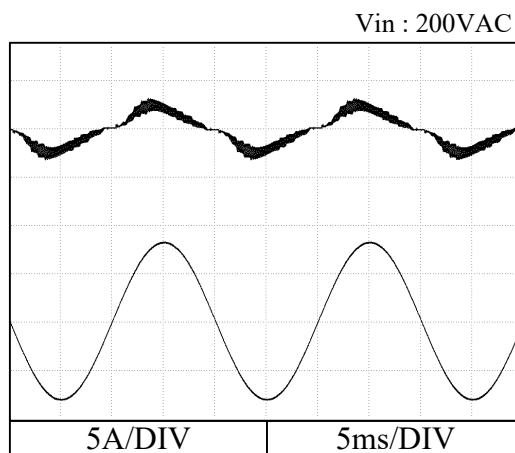
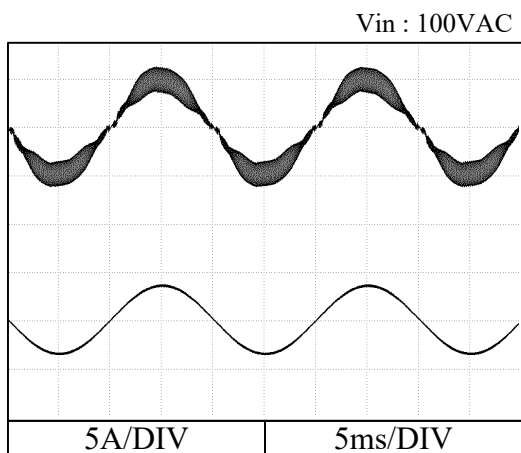
Vin : 230VAC



2-13. 入力電流波形 Input current waveform

Conditions Iout: 100%  
Ta : 25°C

18V



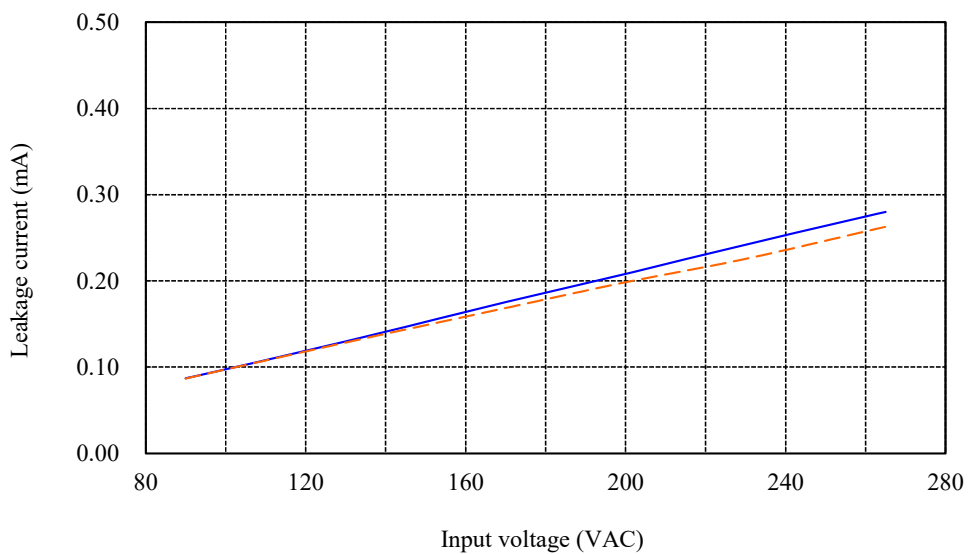


2-14. リーク電流特性 Leakage current characteristics

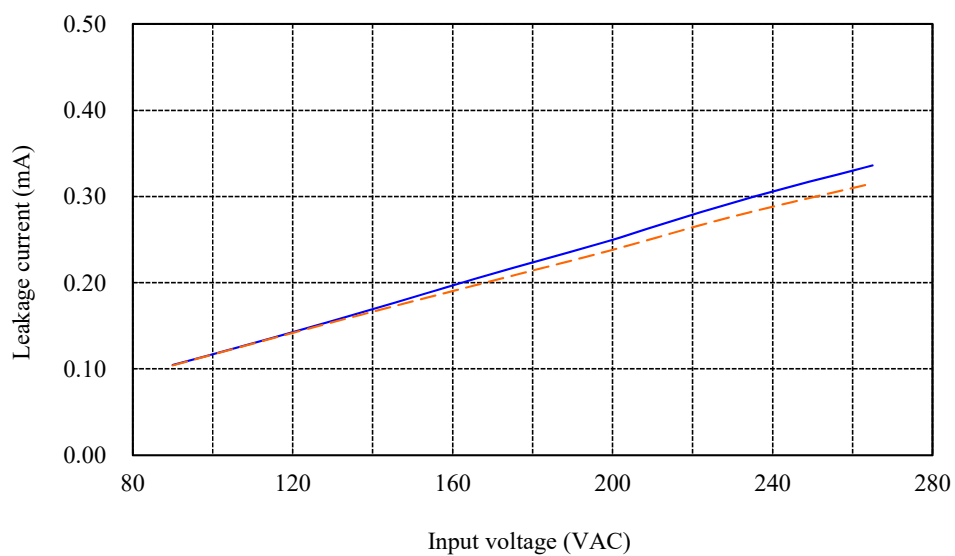
Conditions Iout : 0% ———  
 100% - - - - -  
 Ta : 25°C  
 Equipment used : 3156 (HIOKI)

57V

f : 50Hz



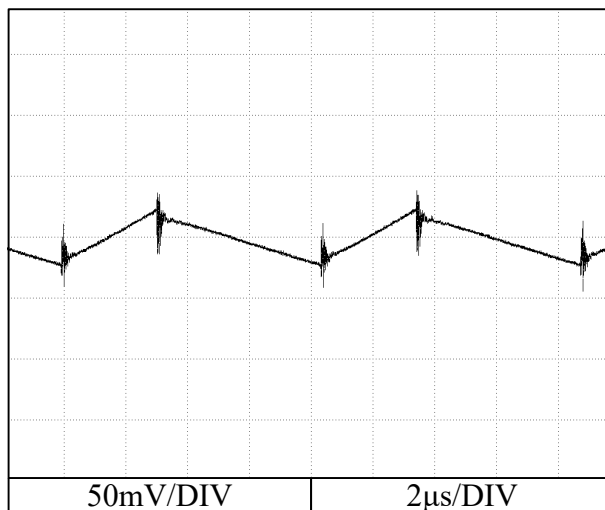
f : 60Hz



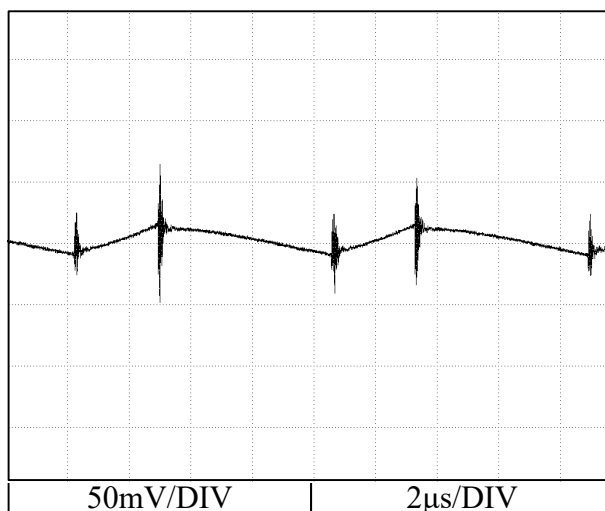
2-15. 出力リップル、ノイズ波形 Output ripple and noise waveform

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

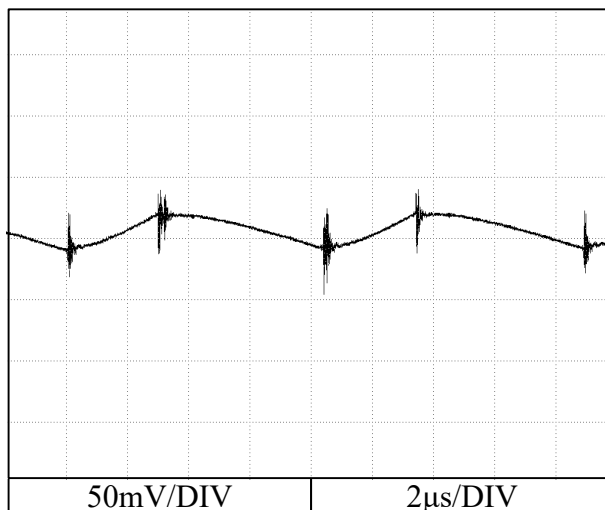
18V



36V



57V



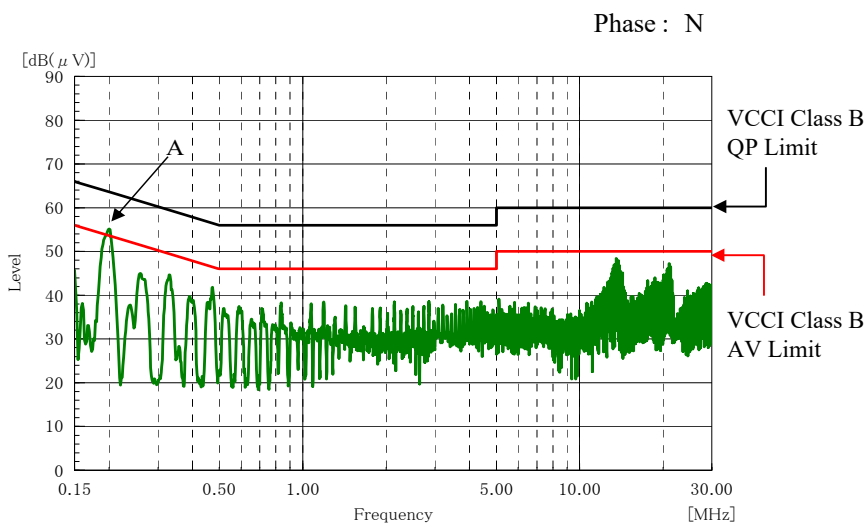
2-16. EMI特性 Electro-Magnetic Interference characteristics

Conditions Vin : 230VAC  
Iout : 100%  
Ta : 25°C

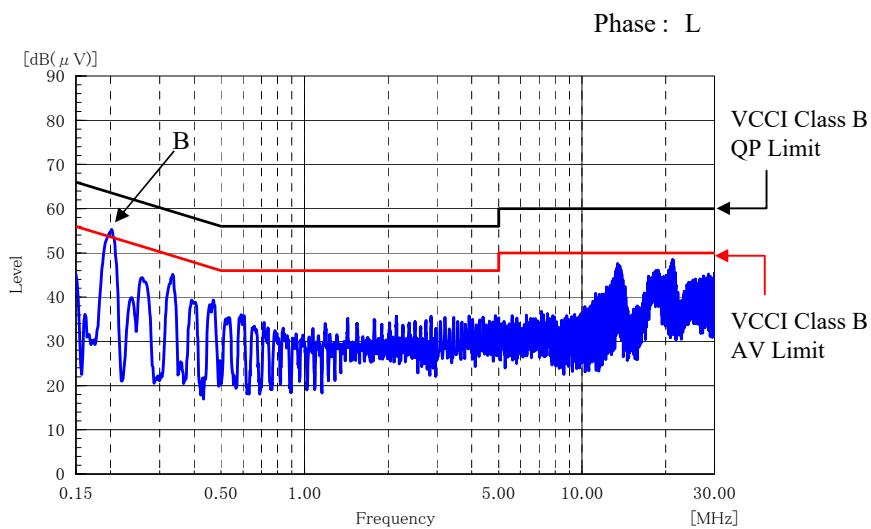
雑音端子電圧 Conducted Emission

18V

Point A (195kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	63.8	52.1
AV	53.8	44.2



Point B (198kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	63.7	52.0
AV	53.7	46.1



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.

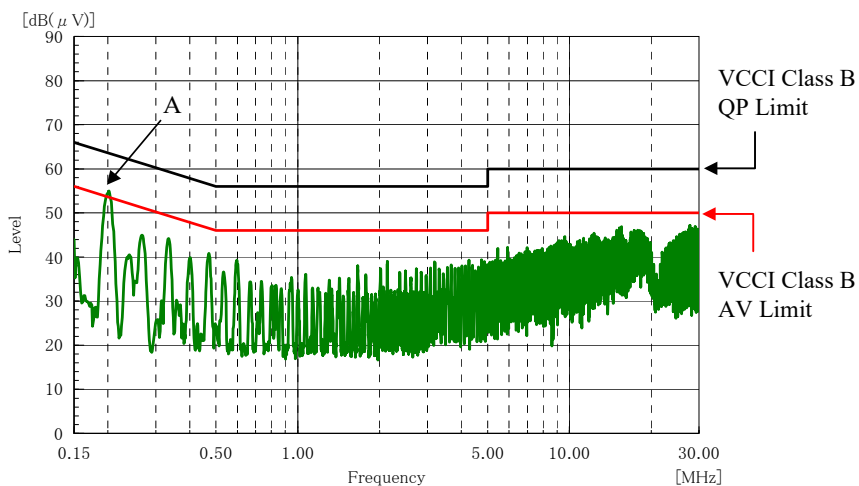
2-16. EMI特性 Electro-Magnetic Interference characteristics

Conditions Vin : 230VAC  
Iout : 100%  
Ta : 25°C

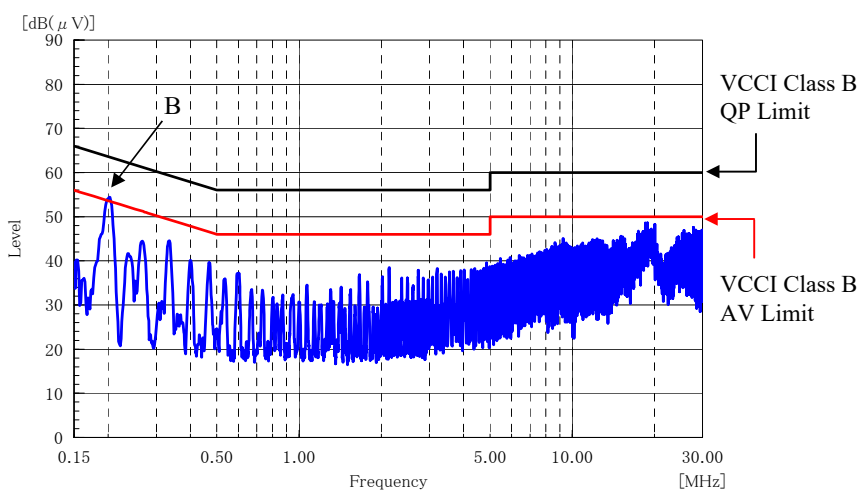
雑音端子電圧 Conducted Emission

36V

Point A (199kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	63.7	52.7
AV	53.7	47.5



Point B (199kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	63.7	53.0
AV	53.7	47.6



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.

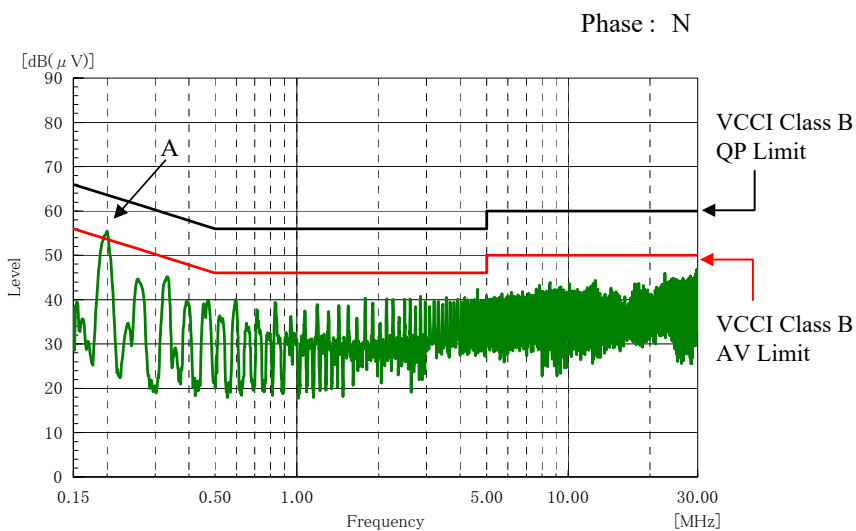
2-16. EMI特性 Electro-Magnetic Interference characteristics

Conditions Vin : 230VAC  
 Iout : 100%  
 Ta : 25°C

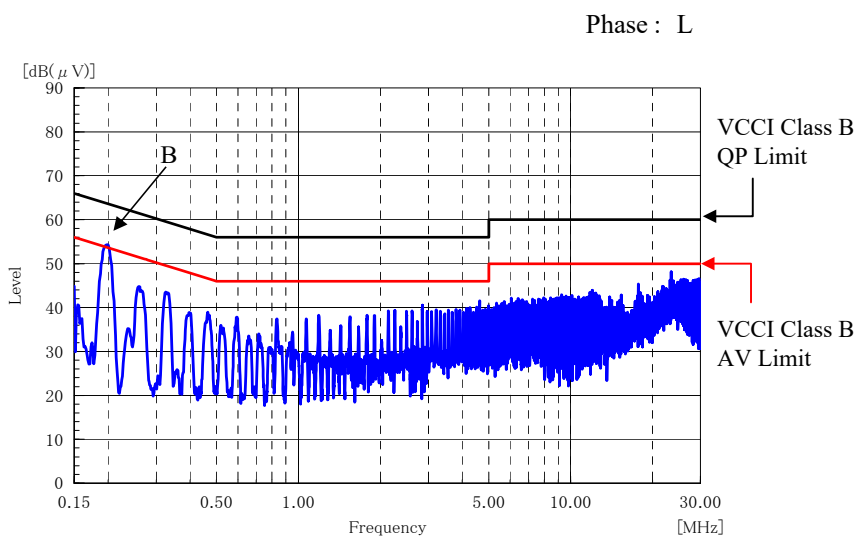
雑音端子電圧 Conducted Emission

57V

Point A (202kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	63.6	53
AV	53.6	46.9



Point B (202kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	63.7	53.7
AV	52.4	46.5



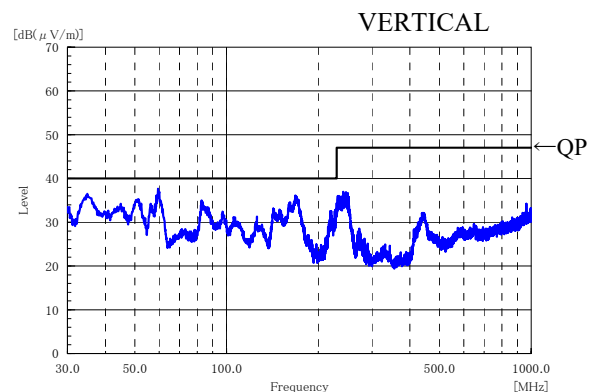
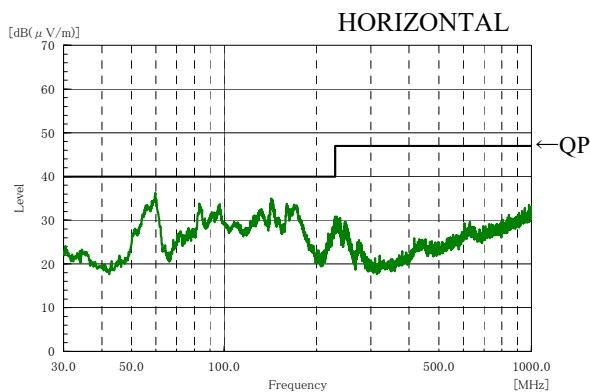
EN55011-B,EN55032-B,FCC-Bの限界値はVCCI class Bの限界値と同じ  
 Limit of EN55011-B,EN55032-B,FCC-B are same as its VCCI class B.

2-16. EMI特性 Electro-Magnetic Interference characteristics

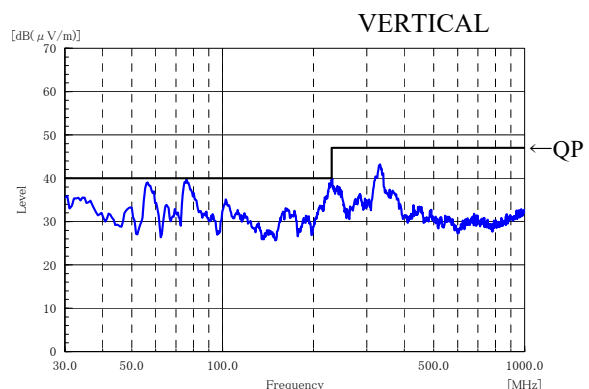
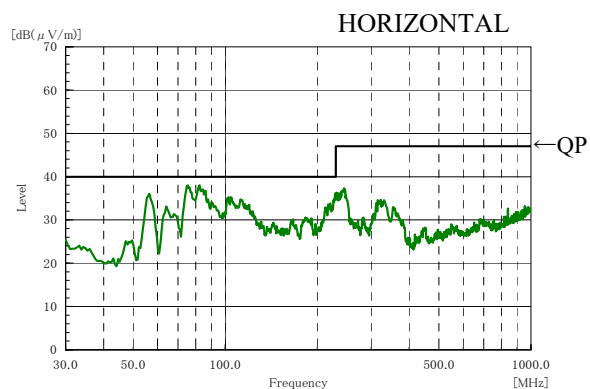
Conditions Vin : 230VAC  
 Iout : 100%  
 Ta : 25°C

雑音電界強度 Radiated Emission

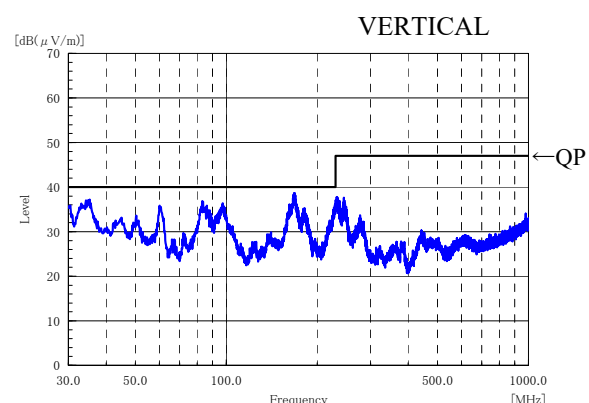
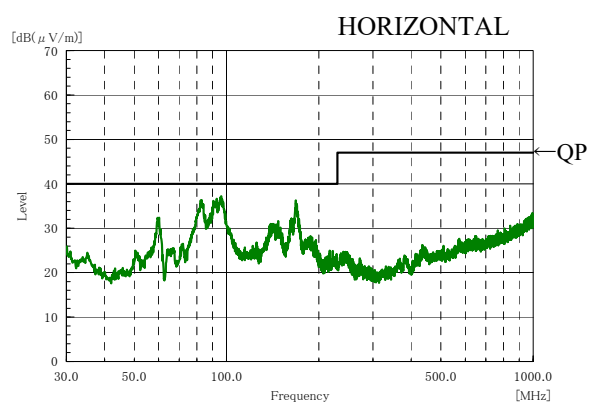
18V



36V



57V



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.