

ELC90

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・低下電圧

Regulation - line and load, Temperature drift

/ Start up voltage and Drop out voltage T-5

(2) リップル電流対出力電圧

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使用記号 Terminology used

		定義	Definition
Vin	入力電圧	Input voltage
Vout	出力電圧	Output voltage
Iin	.....	入力電流	Input current
Iout	.....	出力電流	Output current
Ta	.....	周囲温度	Ambient temperature
f	.....	周波数	Frequency

※ 当社標準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。

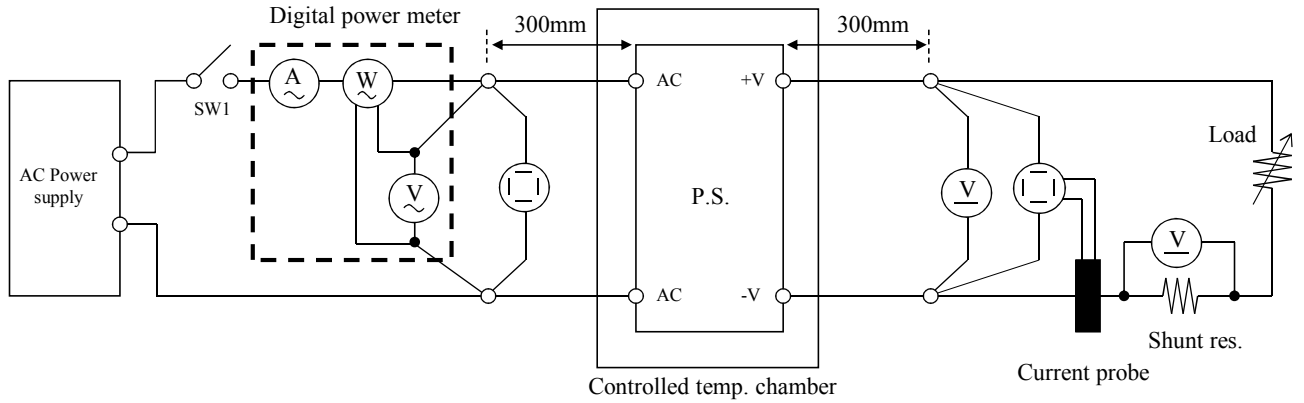
Test results are reference data based on our standard measurement condition.

1. 測定方法 Evaluation Method

1.1 測定回路 Circuit used for determination

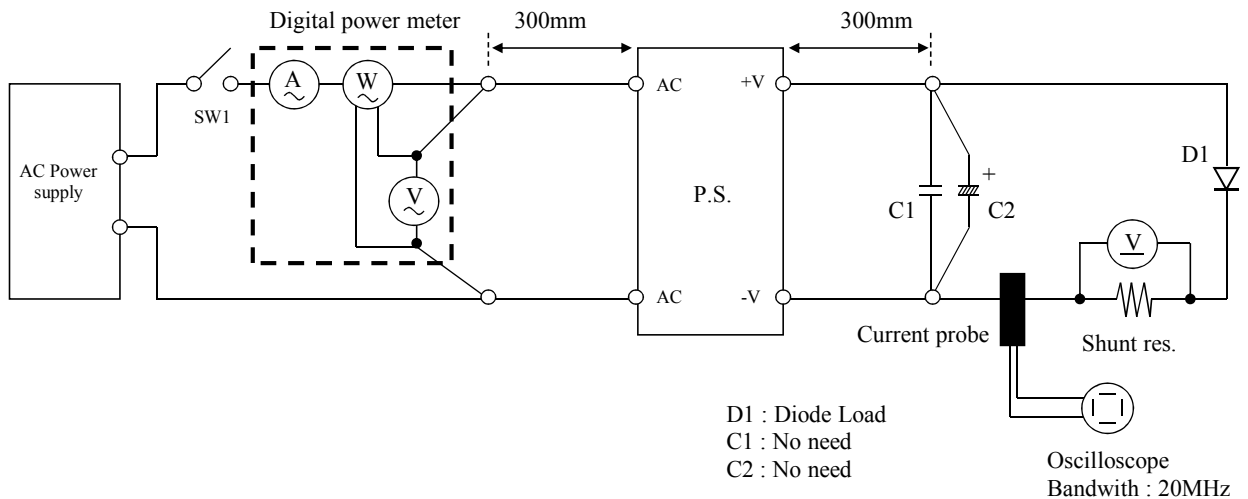
測定回路1 Circuit 1 used for determination

- ・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



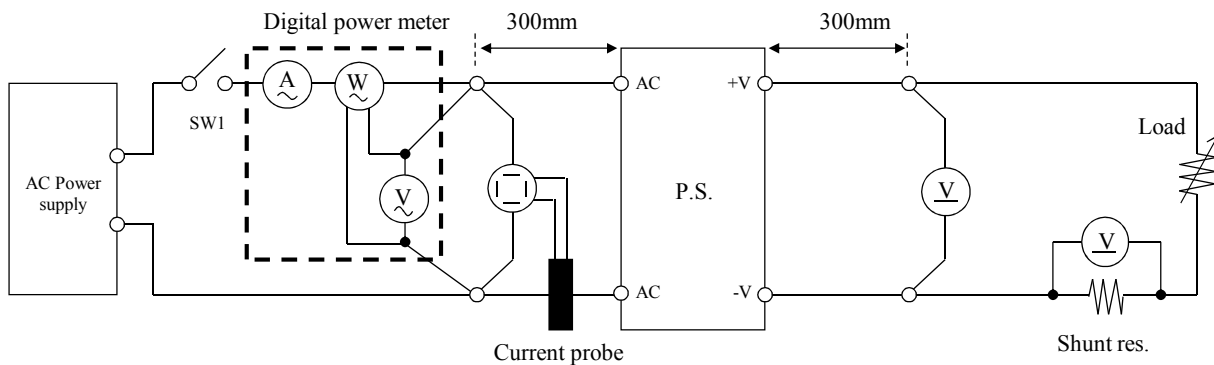
測定回路2 Circuit 2 used for determination

- ・出力立ち上がり特性 Output rise characteristics
- ・出力立ち下がり特性 Output fall characteristics
- ・過渡応答(入力急変)特性 Dynamic line response characteristics
- ・入力電圧瞬停特性 Response to brown out characteristics
- ・出力リップル、ノイズ波形 Output ripple and noise waveform



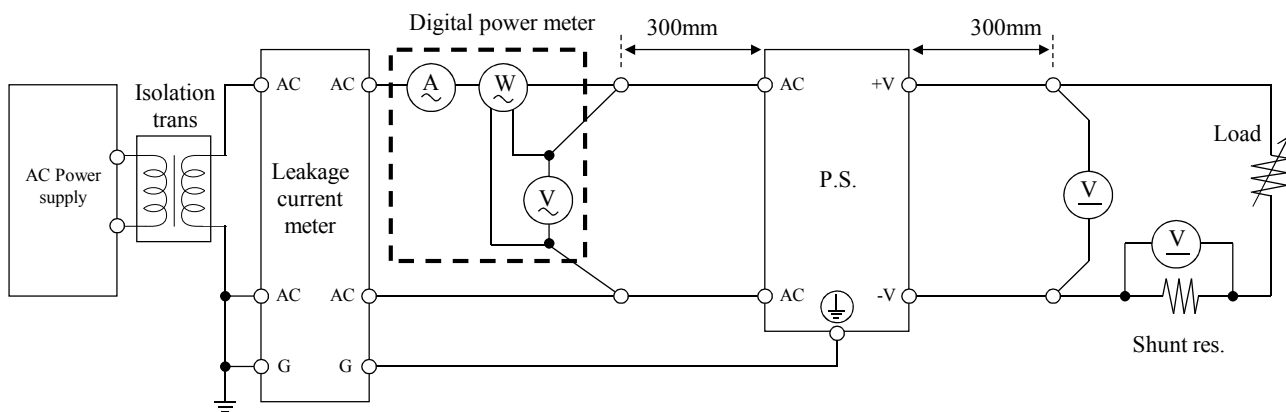
測定回路3 Circuit 3 used for determination

- ・入力サージ電流 (突入電流) 波形 Inrush current waveform
- ・入力電流波形 Input current waveform



測定回路4 Circuit 4 used for determination

- ・リーク電流特性 Leakage current characteristics

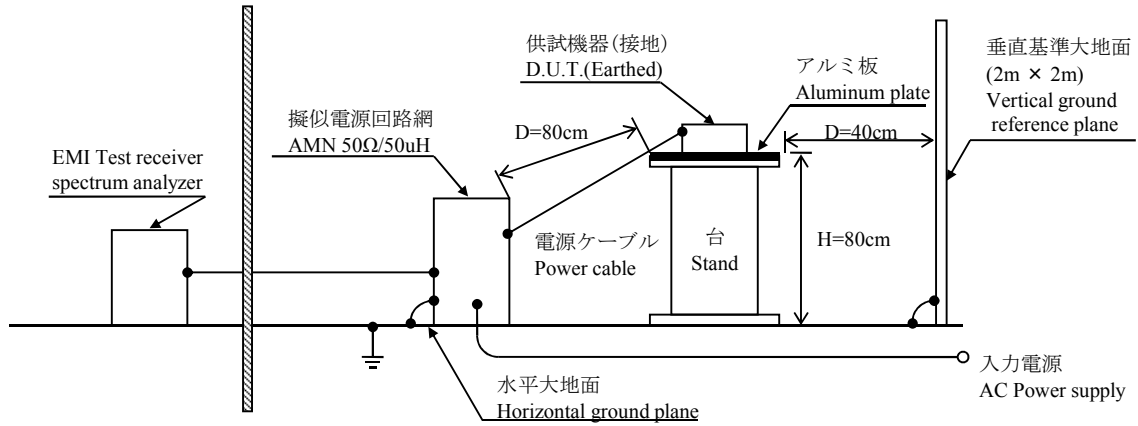


測定構成 Configuration used for determination

・EMI特性 Electro-Magnetic Interference characteristics

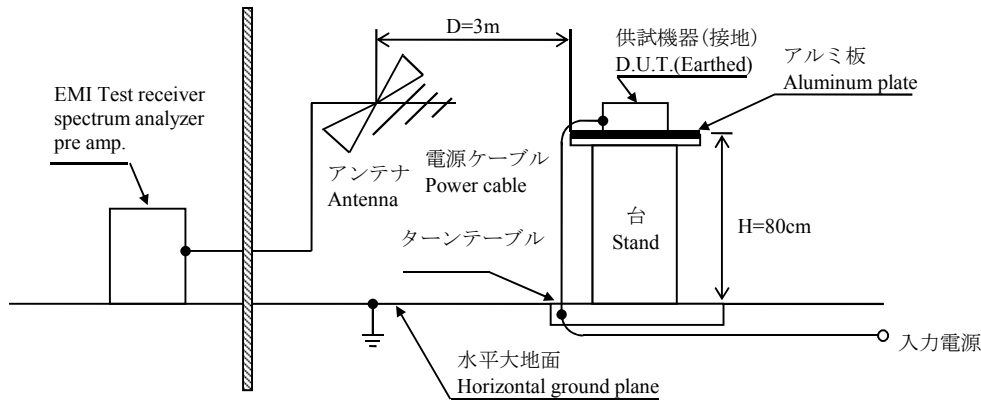
(a) 雑音端子電圧 (帰還ノイズ)

Conducted Emission



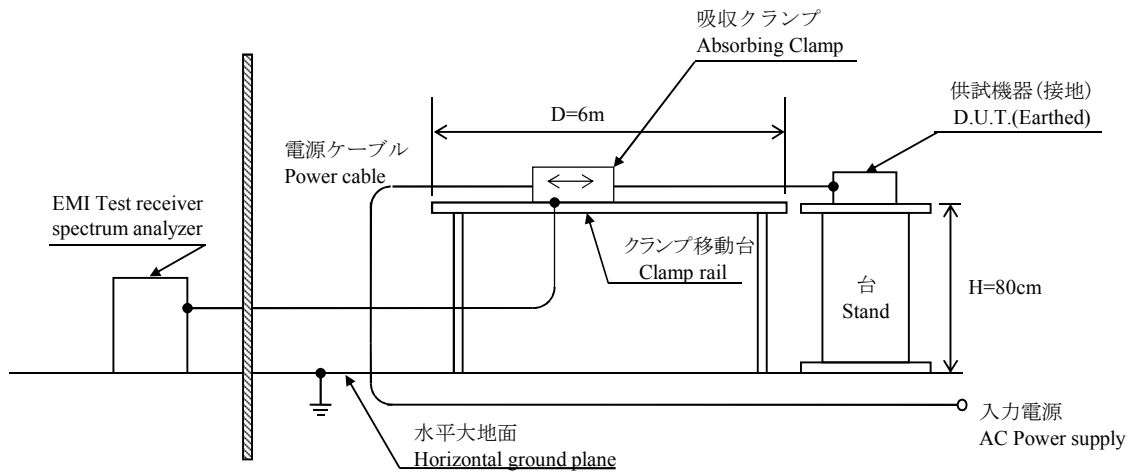
(b) 雑音電界強度 (放射ノイズ)

Radiated Emission



(c) 妨害波電力

Disturbance Power



1.2 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DL9040L
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-200L
7	DYNAMIC DUMMY LOAD	KIKUSUI	PLZ150U
8	DIODE LOAD	TDK-LAMBDA	—
9	ISOLATION TRANS	MATSUNAGA	3WTC-50K
10	CVCF	KIKUSUI	PCR4000L
11	CVCF	NF	ES10000S
12	LEAKAGE CURRENT METER	HIOKI	3156
13	CONTROLLED TEMP. CHAMBER	ESPEC	SU-261 / PL-4KP
14	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESCI
15	PRE AMP.	SONOMA	310N
16	AMN	SCHWARZBECK	NNLK8121
17	ANTENNA	SCHWARZBECK	CBL6111D
18	ABSORBING CLAMP	LUTHI	MDS-21
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

Iout	0.70A
Vout : 100%	130V
Vout : min	50V

2.1 静特性 Steady state data

(1) 入力・負荷・温度変動／出力起動・低下電圧

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

1. Regulation - line and load

Condition Ta : 25 °C

Vout \ Vin	90VAC	100VAC	200VAC	305VAC	line regulation	
50V	0.701A	0.701A	0.701A	0.701A	0mA	0.000%
90V	0.701A	0.701A	0.701A	0.701A	0mA	0.000%
130V	0.701A	0.701A	0.701A	0.701A	0mA	0.000%
load regulation	0mA	0mA	0mA	0mA	0.000%	0.000%

2. Temperature drift

Conditions Vin : 100 VAC

Vout : 100 %

Ta	-25°C	+25°C	+50°C	temperature stability	
Iout	0.705A	0.701A	0.709A	8mA	1.143%

3. Total regulation

(Total regulation of Line reg, Load reg and Temp. drift)

total regulation	
8mA	1.1%

4. Start up voltage and Drop out voltage

Conditions Ta : 25 °C

Vout : 100 %

Start up voltage (Vin)	66VAC
Drop out voltage (Vin)	62VAC

(2) リップル電流対出力電圧

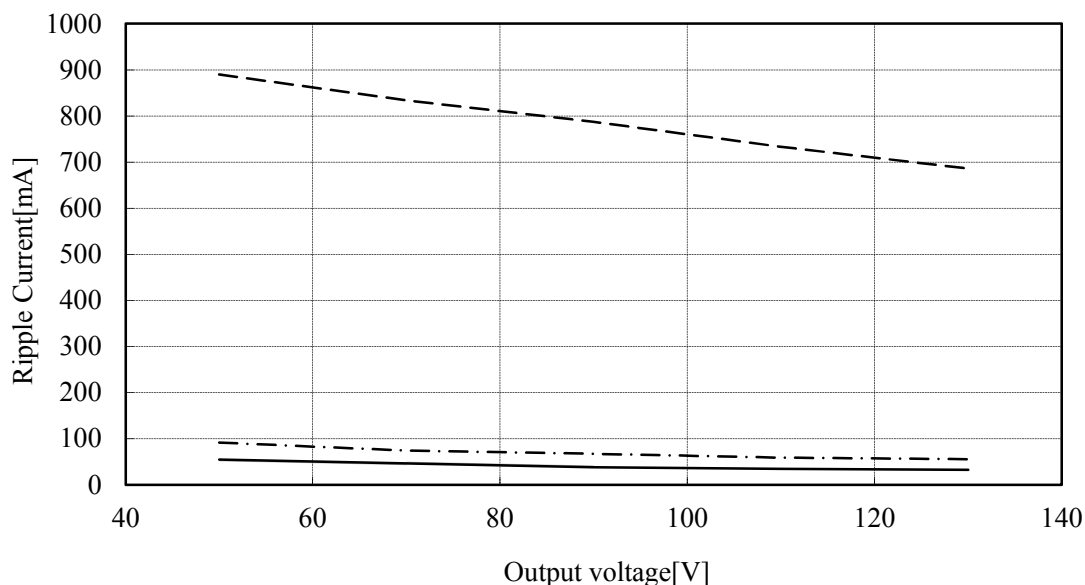
Ripple Current vs. Output voltage

Conditions Vin : 100 VAC

Ta : -25 °C ---

25 °C - · - · -

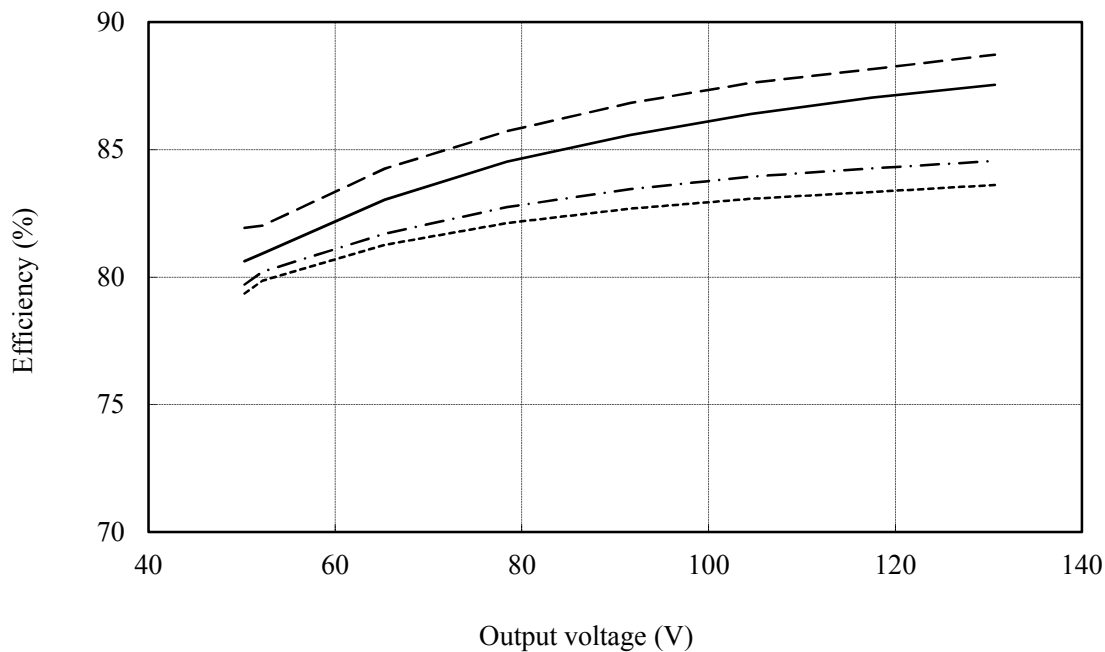
50 °C —



(3) 効率が出力電圧

Efficiency vs. Output voltage

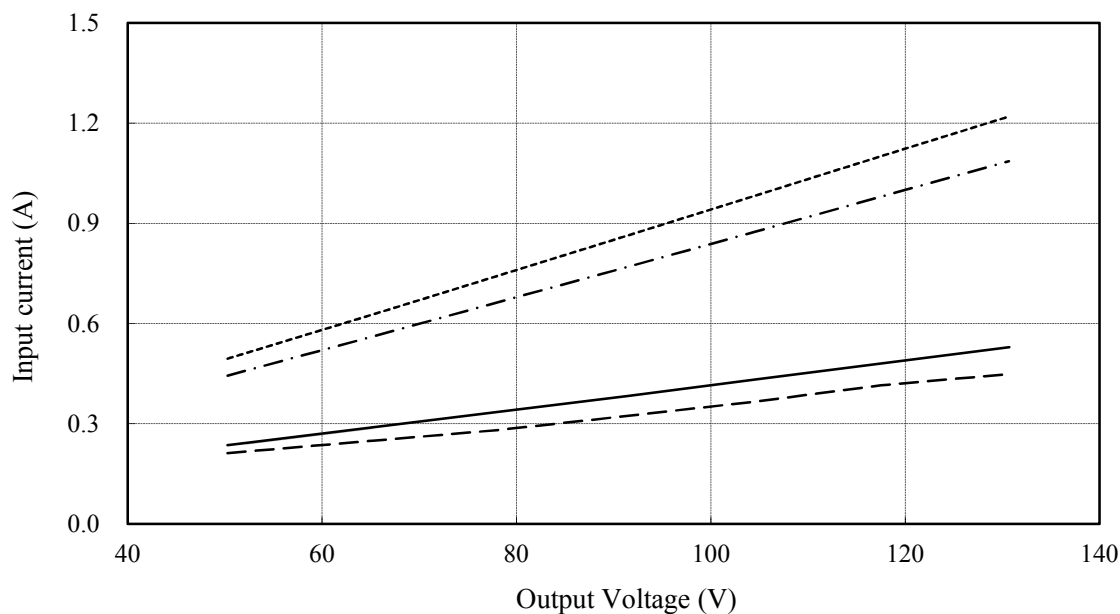
Conditions Vin : 90 VAC -----
 100 VAC -.-.-.-
 200 VAC ————
 305 VAC -.-.-.-
 Ta : 25 °C



(4) 入力電流が出力電圧

Input current vs. Output voltage

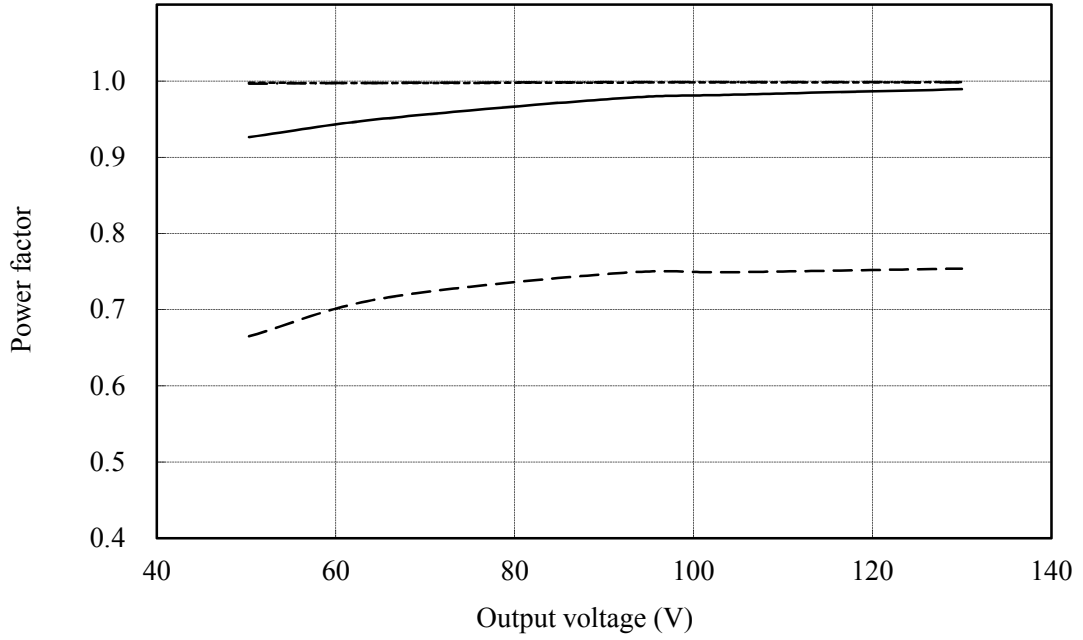
Conditions Vin : 90 VAC -----
 100 VAC -.-.-.-
 200 VAC ————
 305 VAC -.-.-.-
 Ta : 25 °C



(5) 力率対出力電圧

Power factor vs. Output voltage

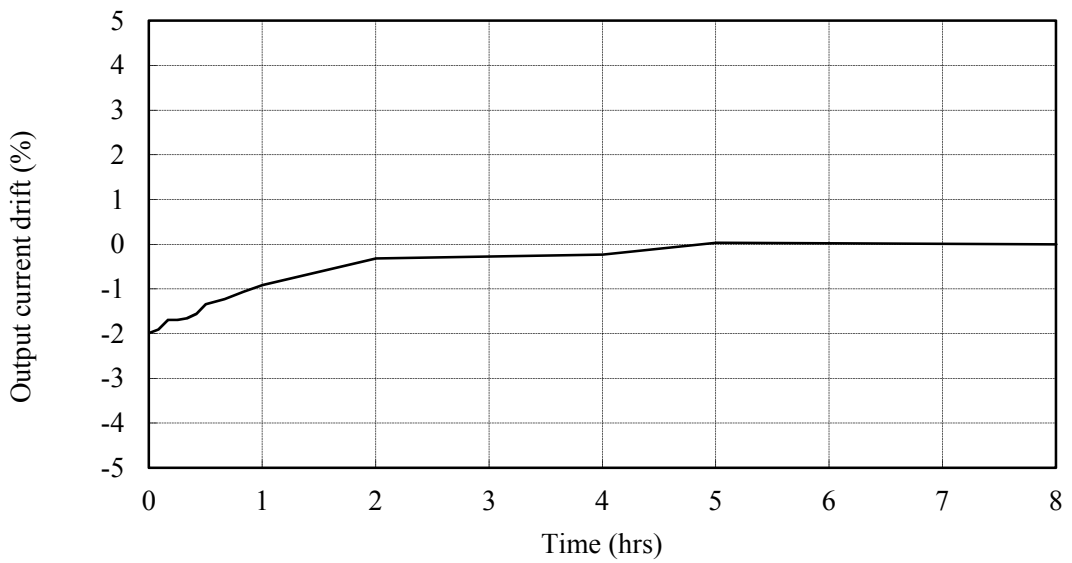
Conditions Vin : 90 VAC -----
 100 VAC - - - - -
 200 VAC ————
 305 VAC - - - - -
 Ta : 25 °C



2.2 通電ドリフト特性

Warm up current drift characteristics

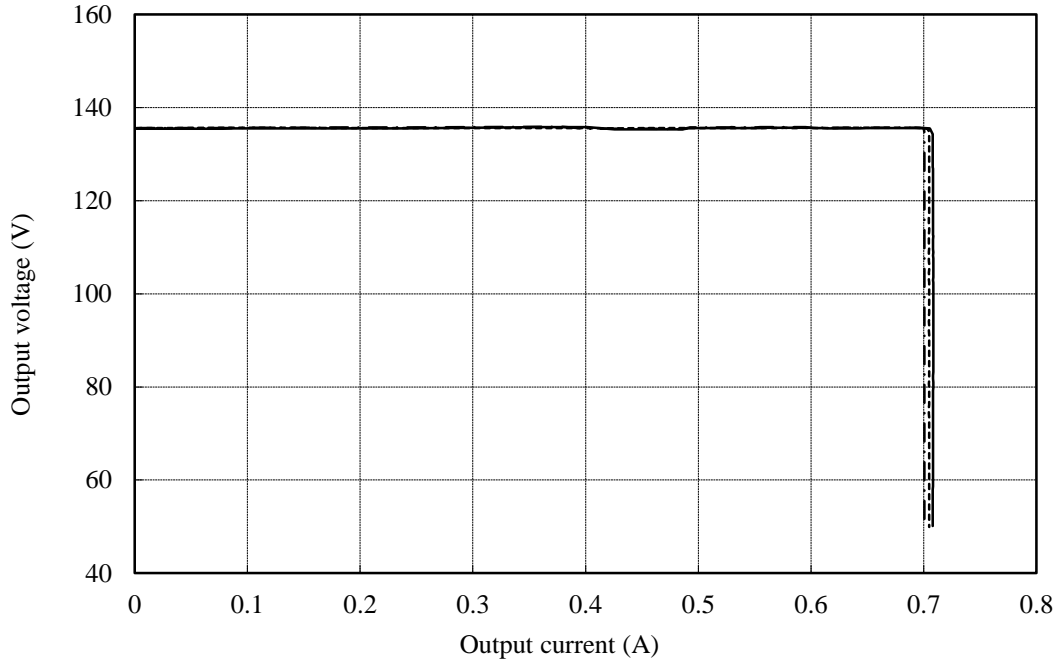
Conditions Vin : 100 VAC
 Vout : 100 %
 Ta : 25 °C



2.3 出力電流対出力電圧特性

Output current vs. Output voltage characteristics

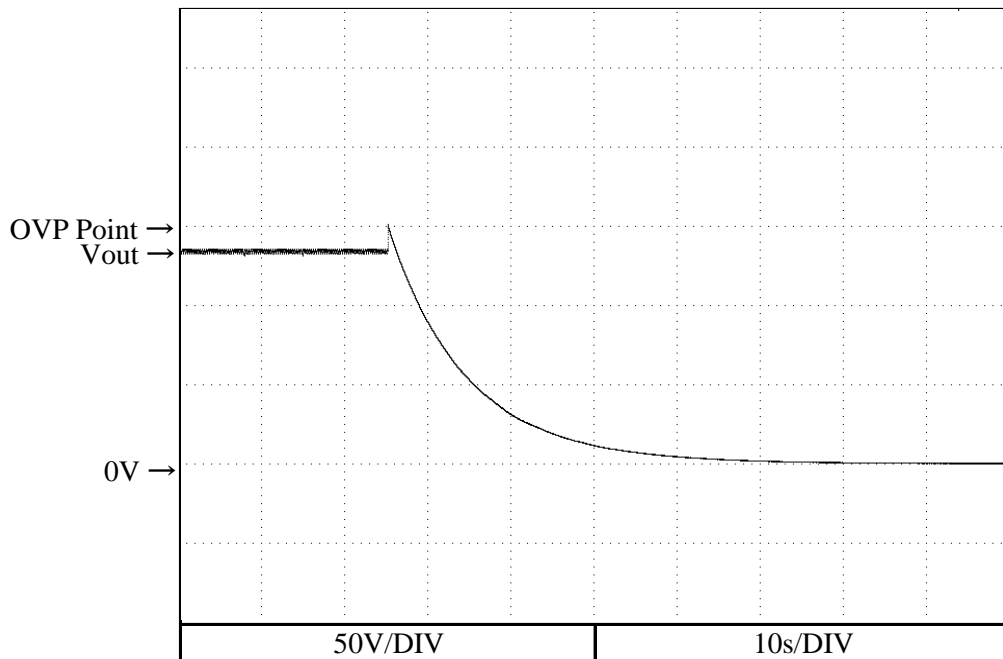
Conditions Vin : 100 VAC
 Ta : -25 °C -----
 25 °C -.-.-.-
 50 °C ———



2.4 過電圧保護特性

Over voltage protection (OVP) characteristics

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

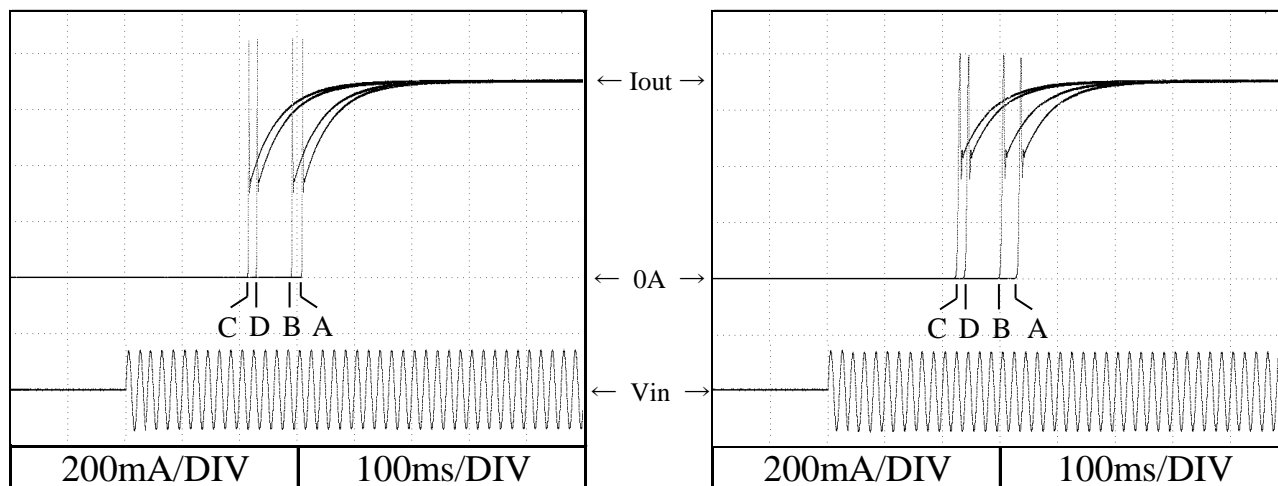


2.5 出力立ち上がり特性
Output rise characteristics

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

Vout : min

Vout : 100%

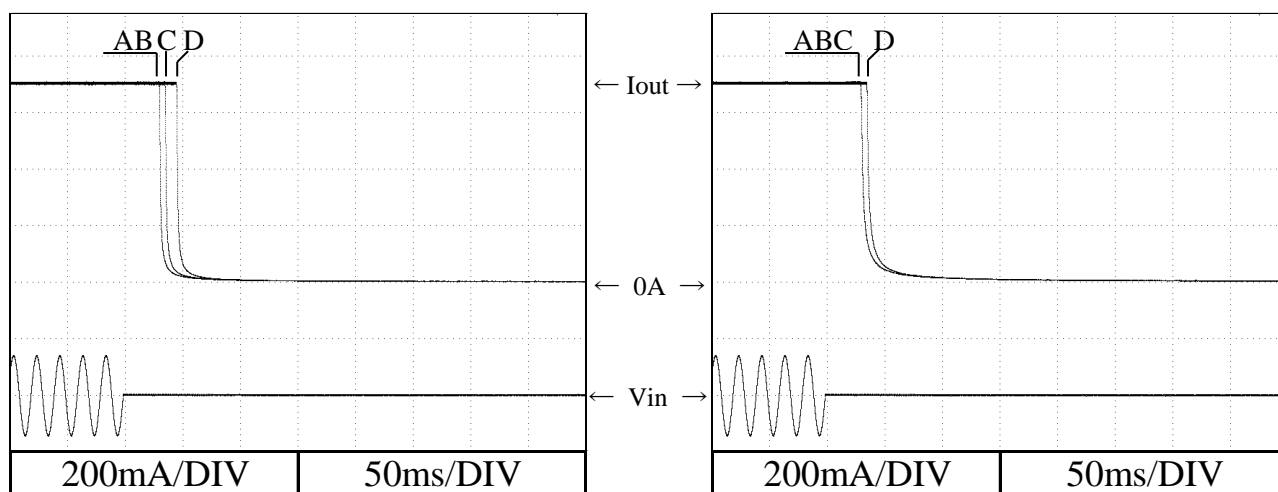


2.6 出力立ち下がり特性
Output fall characteristics

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

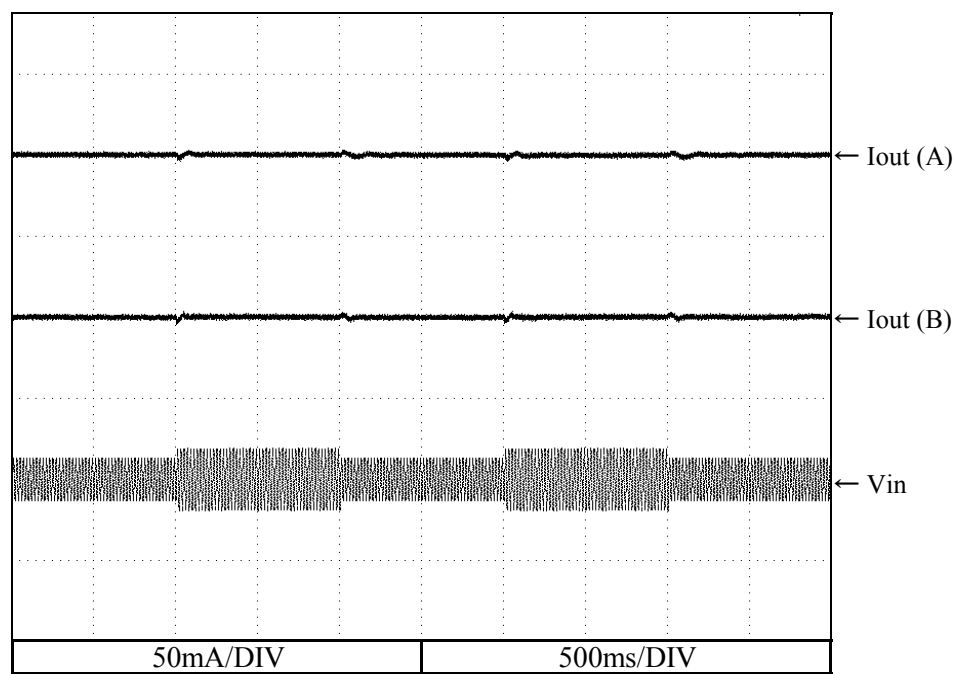
Vout : min

Vout : 100%



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

Conditions Vin : 90 VAC ↔ 132 VAC(A)
170 VAC ↔ 305 VAC(B)
Vout : 100 %
Ta : 25 °C



2.8 入力電圧瞬停特性
Response to brown out characteristics

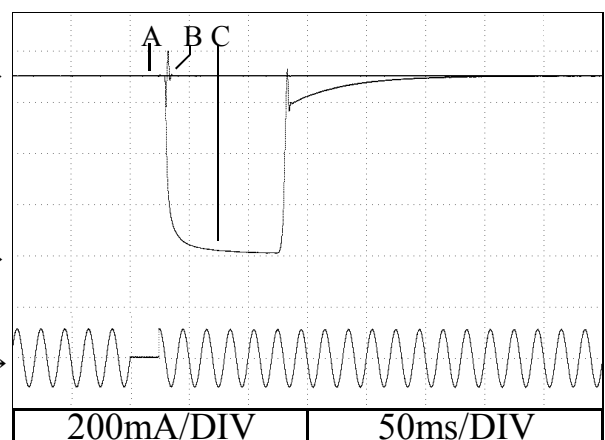
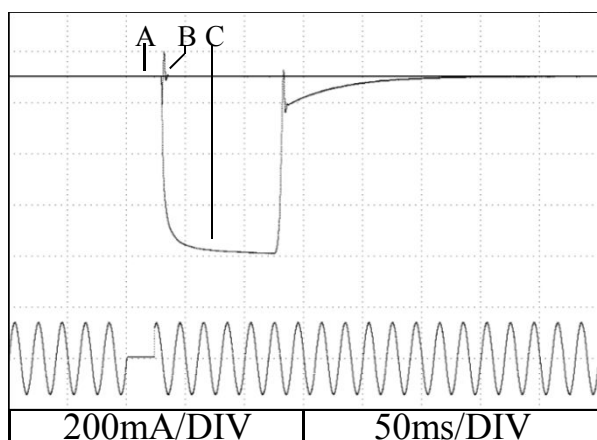
Conditions Vout : 100 %
Ta : 25 °C

Vin : 100VAC

A = 21ms
B = 22ms
C = 23ms

Vin : 200VAC

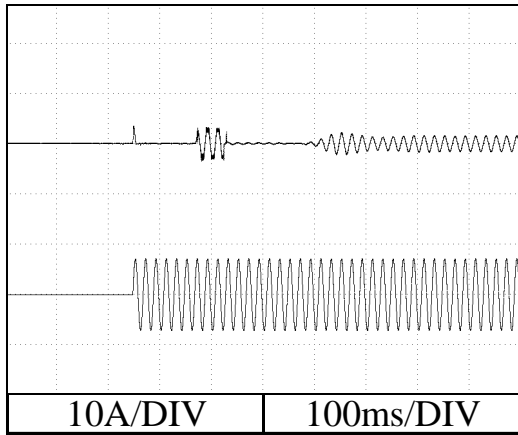
A = 22ms
B = 23ms
C = 24ms



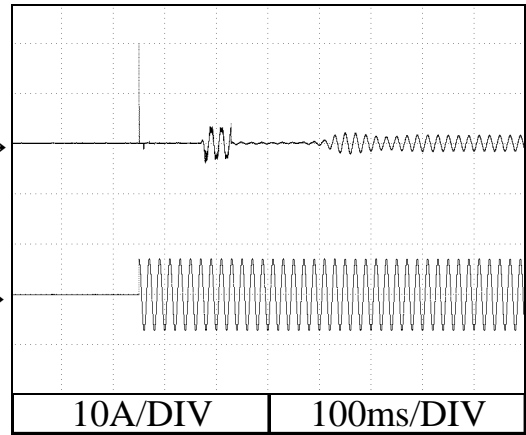
2.9 入力サージ電流（突入電流）波形
Inrush current waveform

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

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

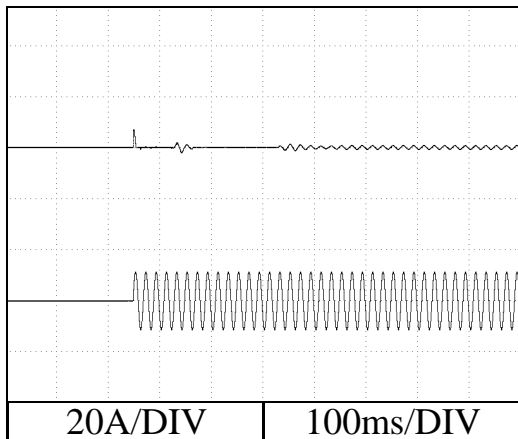


Switch on phase angle of input AC voltage
 $\phi = 90^\circ$

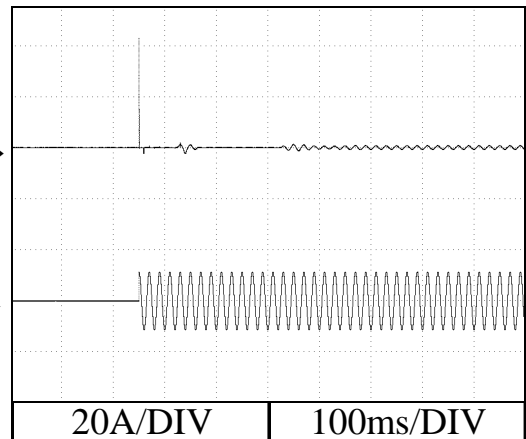


Conditions Vin : 200 VAC
Vout : 100 %
Ta : 25 °C

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



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

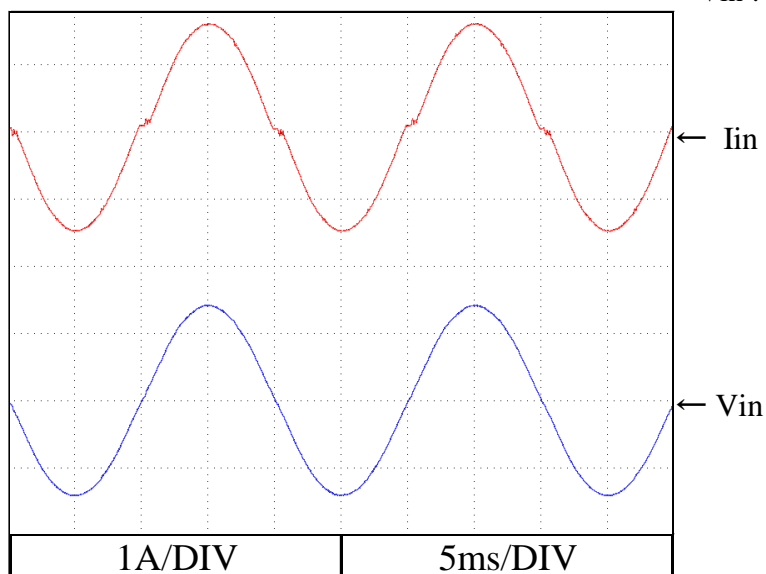


2.10 入力電流波形

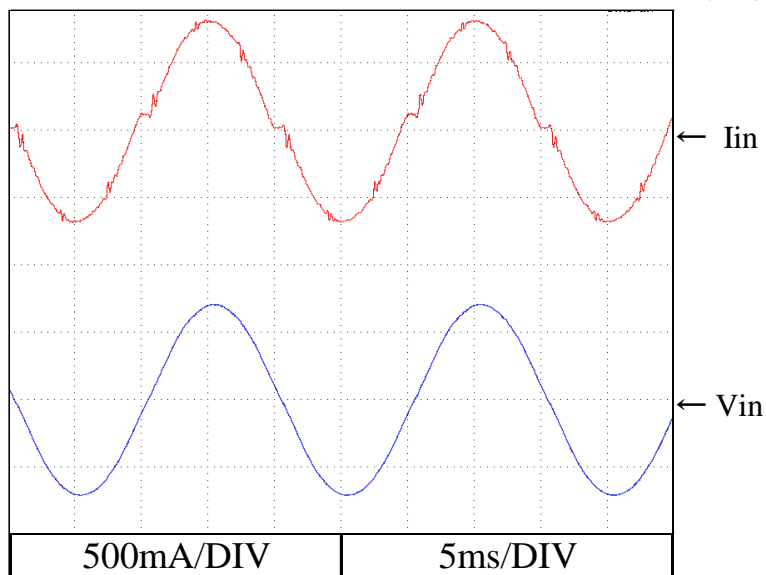
Input current waveform

Conditions Vout : 100 %
Ta : 25 °C

Vin : 100 VAC



Vin : 200 VAC



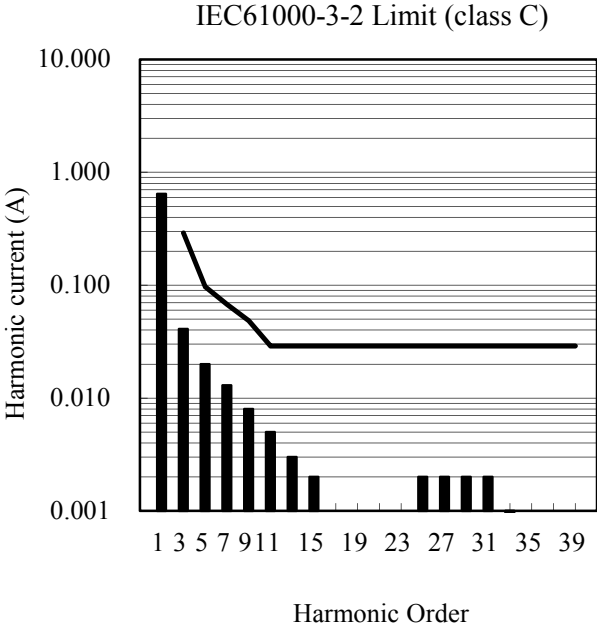
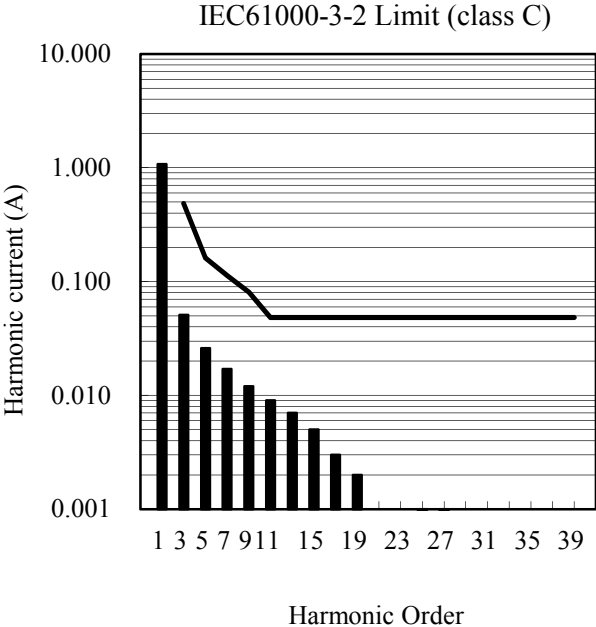
2.11 高調波成分

Input current harmonics

Conditions Vin : 100 VAC
Ta : 25 °C

Vout : 100%

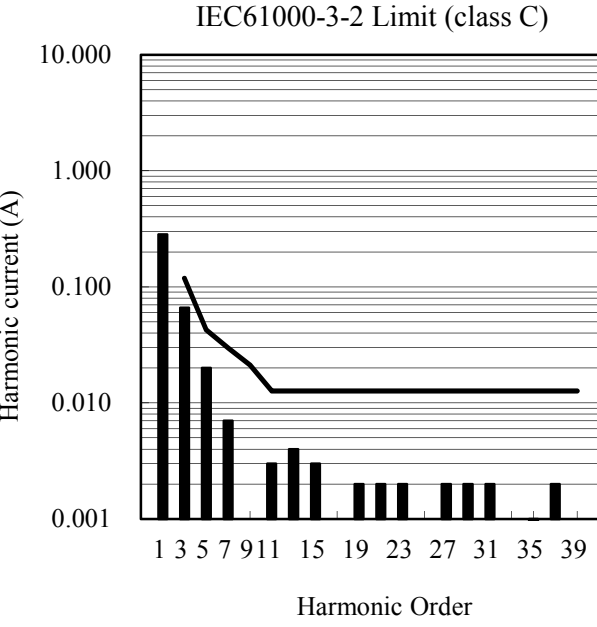
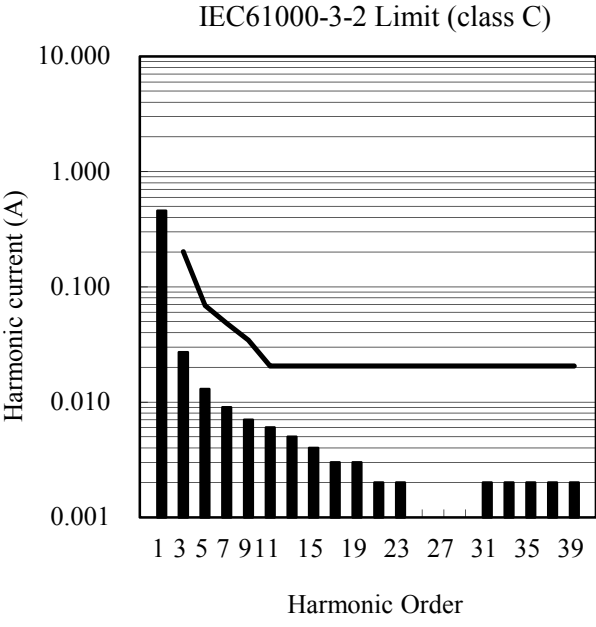
Vout : 50%



Conditions Vin : 230 VAC
Ta : 25 °C

Vout : 100%

Vout : 50%

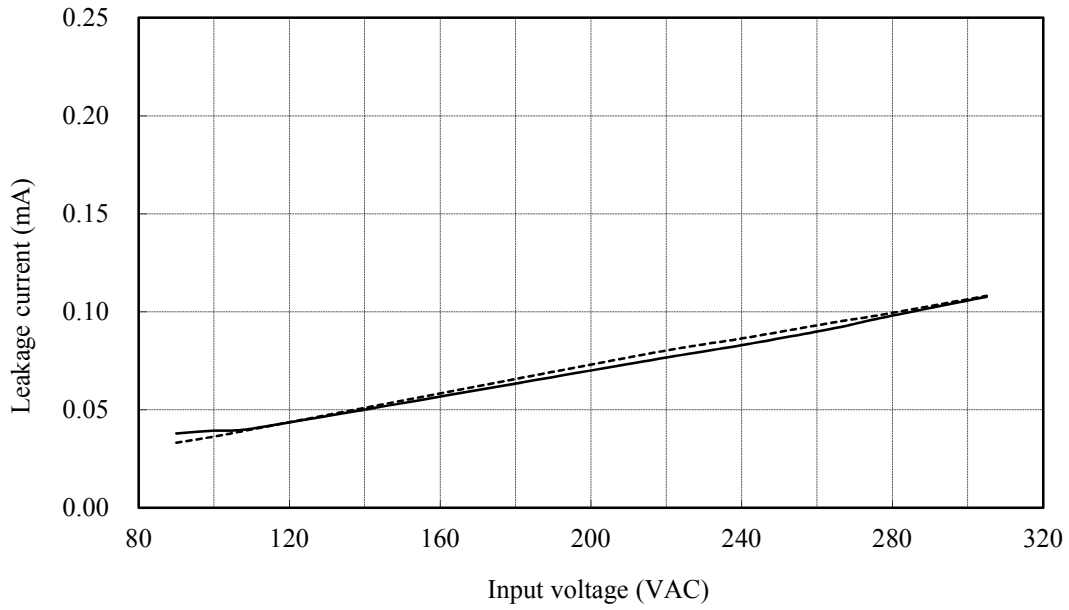


2.12 リーク電流特性
Leakage current characteristics

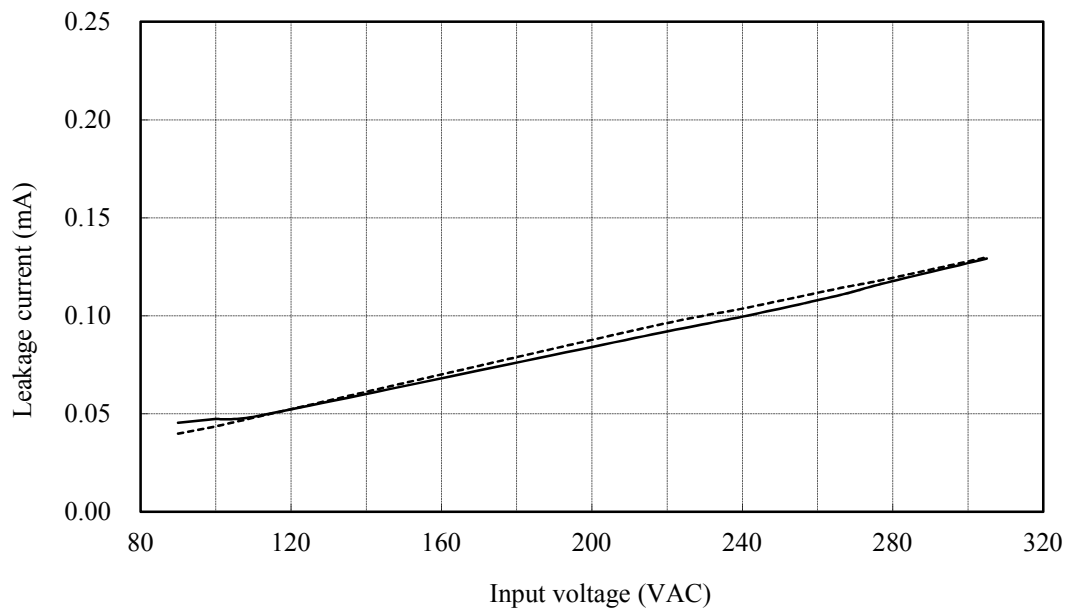
ELC90

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

f: 50 Hz



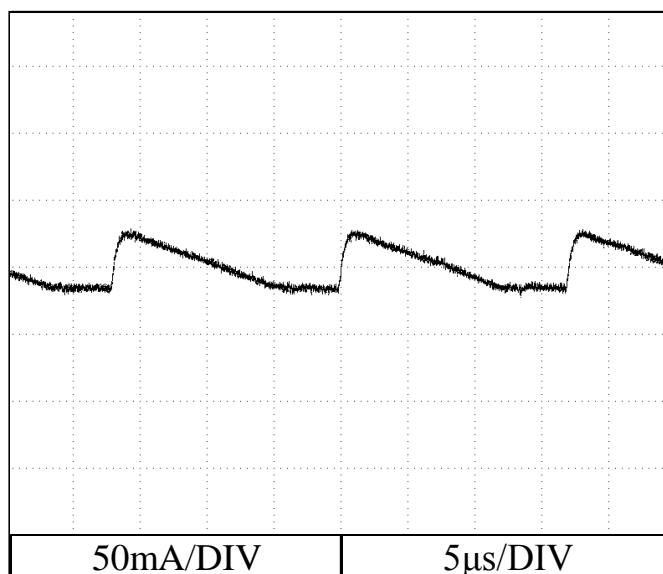
f: 60 Hz



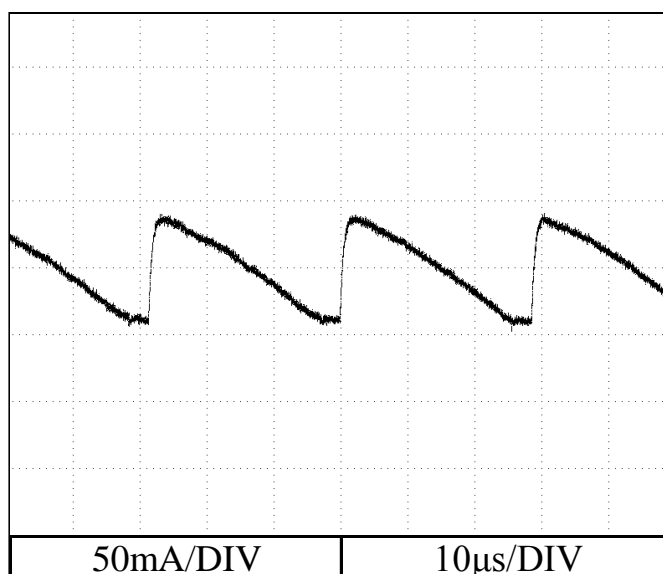
2.13 出力リップル、ノイズ波形
Output ripple and noise waveform

Conditions Vin : 100 VAC
Ta : 25 °C

Vout : 100%



Vout : min



2.14 EMI特性

Electro-Magnetic Interference characteristics

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

雑音端子電圧

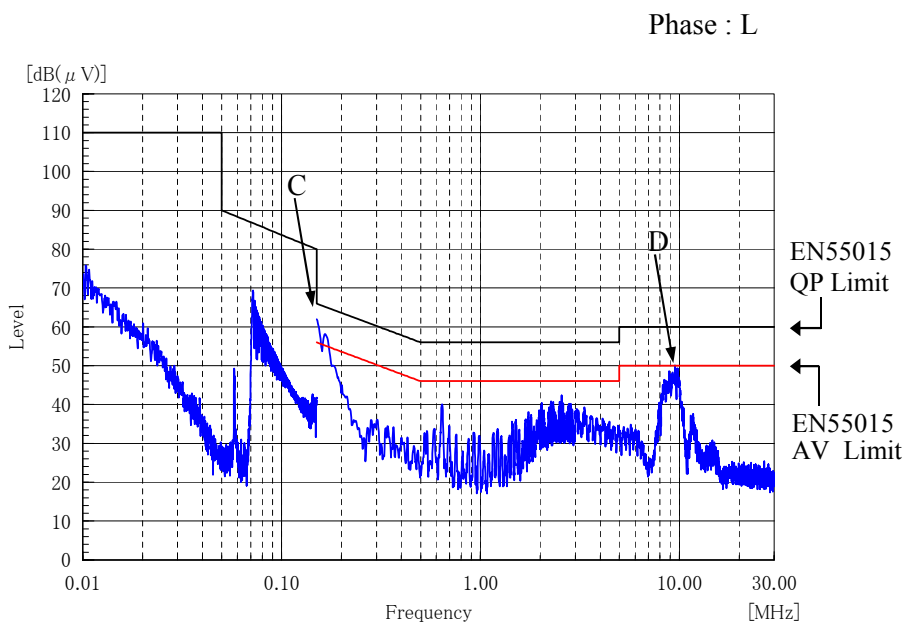
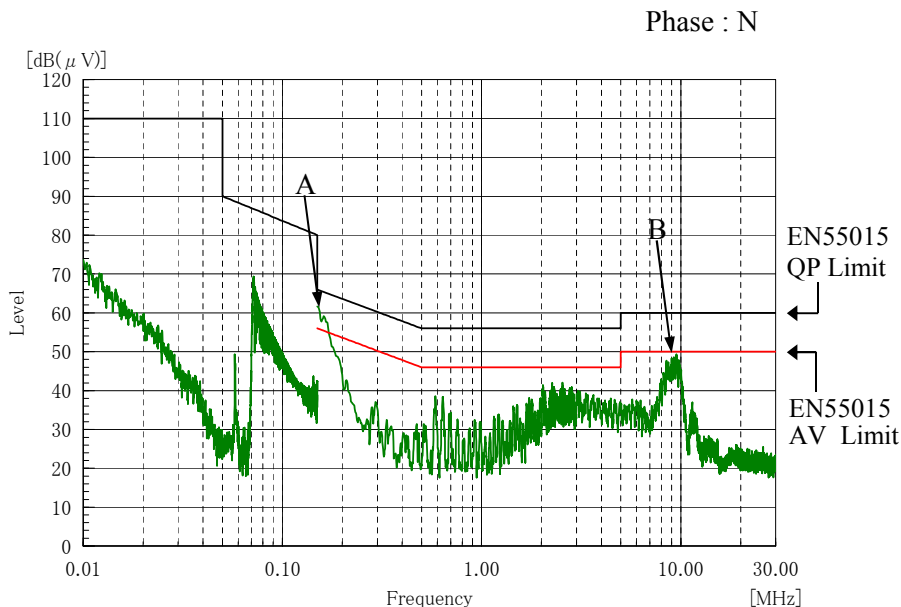
Conducted Emission

Point A (150kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	66.0	59.8
AV	56.0	45.6

Point B (9.5MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	60.0	45.4
AV	50.0	35.1

Point C (150kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	66.0	59.8
AV	56.0	45.6

Point D (9.5MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	60.0	45.4
AV	50.0	34.3



EN55022-B,VCCI-B,CISPR22-B,FCC-Bの限界値はEN55015の限界値と同じ(150kHz以上)
 Limit of EN55022-B,VCCI-B,CISPR22-B,FCC-B are same as its EN55015.(more than 150kHz)

表示はピーク値
 Indication is peak values.

2.14 EMI特性

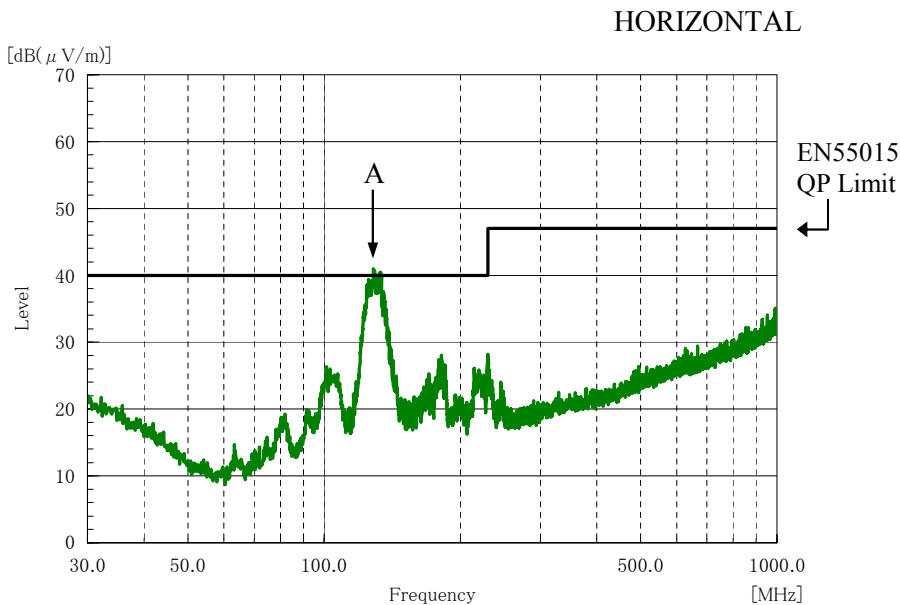
Electro-Magnetic Interference characteristics

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

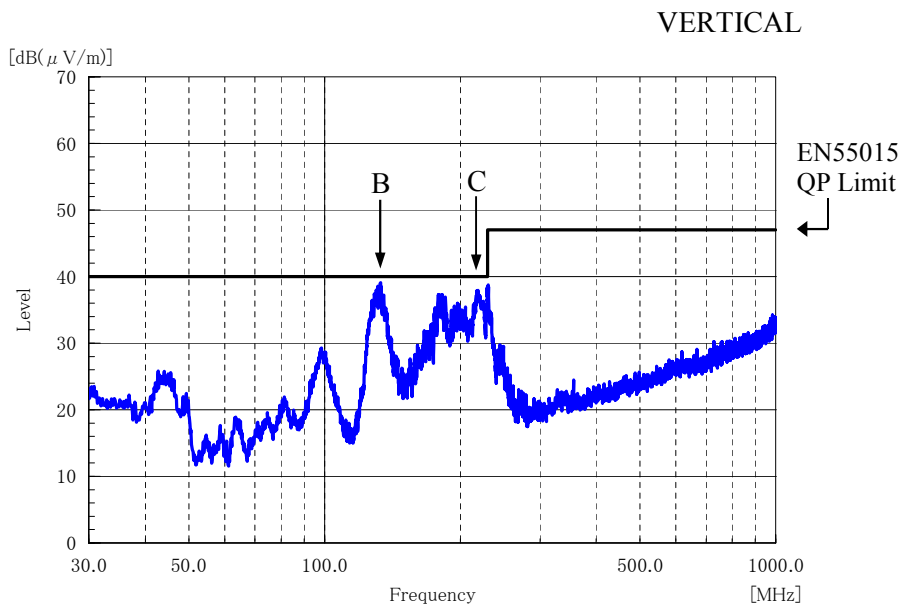
雑音電界強度

Radiated Emission

Point A (129MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	40.0	36.9



Point B (132MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	40.0	33.9



Point C (217MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	40.0	35.2

EN55022-B,VCCI-B,CISPR22-B,FCC-Bの限界値はEN55015の限界値と同じ
 Limit of EN55022-B,VCCI-B,CISPR22-B,FCC-B are same as its EN55015.

表示はピーク値
 Indication is peak values.

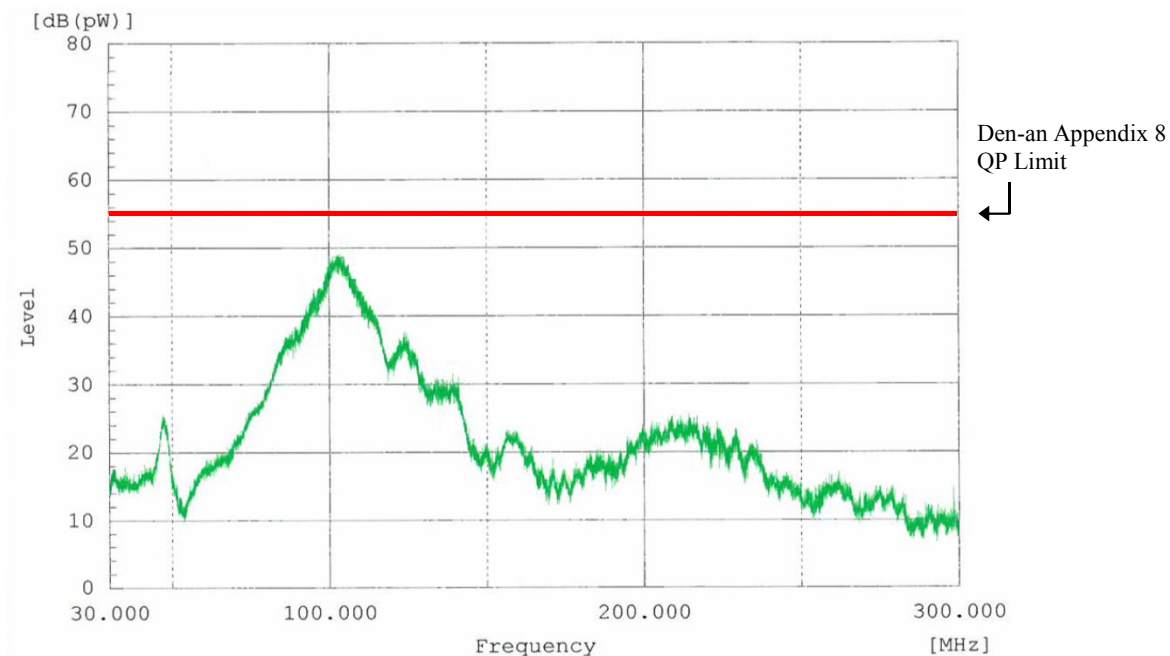
2.14 EMI特性

Electro-Magnetic Interference characteristics

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

妨害波電力

Disturbance Power



表示はピーク値

Indication is peak values.