MTW30-51212

EVALUATION DATA

型式データ

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1. 測定方法 Evaluation Method PAGE

2. 特性データ　Characteristics

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

※ 弊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。

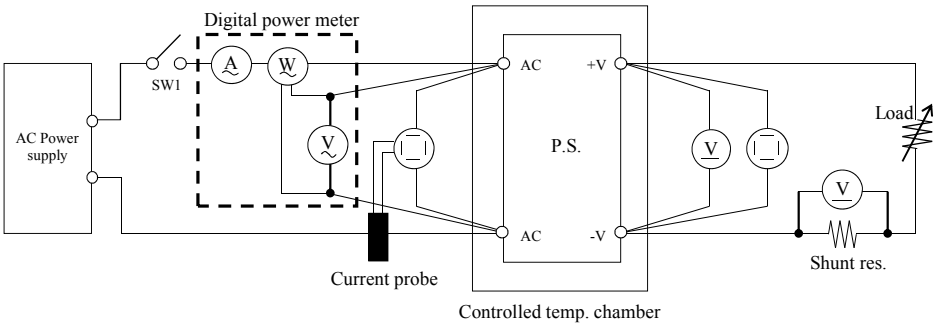
Test results are reference data based on our measurement condition.

1. 測定方法　　Evaluation Method

1.1 測定回路　　Circuit used for determination

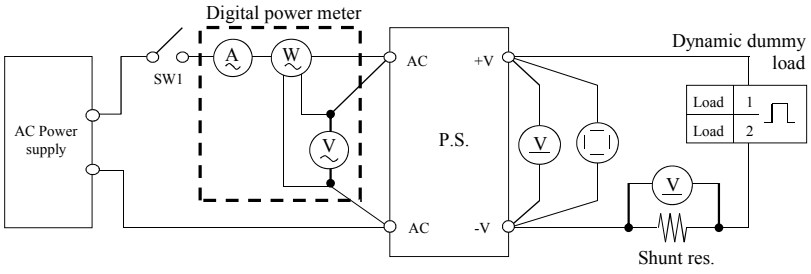
測定回路1 Circuit 1 used for determination

- ・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
- ・過電流保護特性　Over current protection (OCP) 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

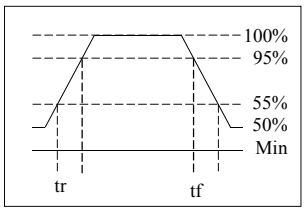


測定回路2 Circuit 2 used for determination

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

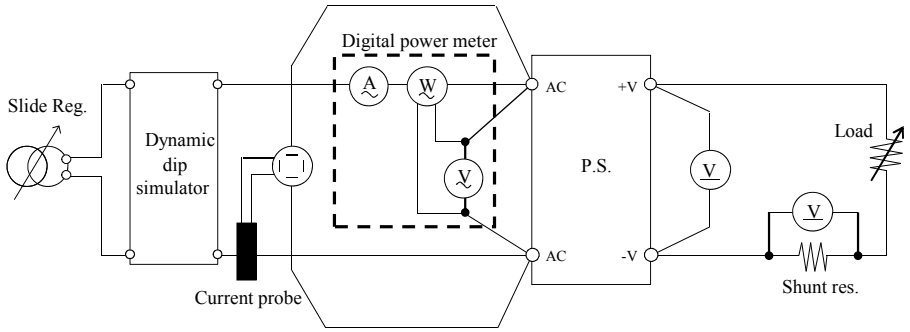


Output current waveform



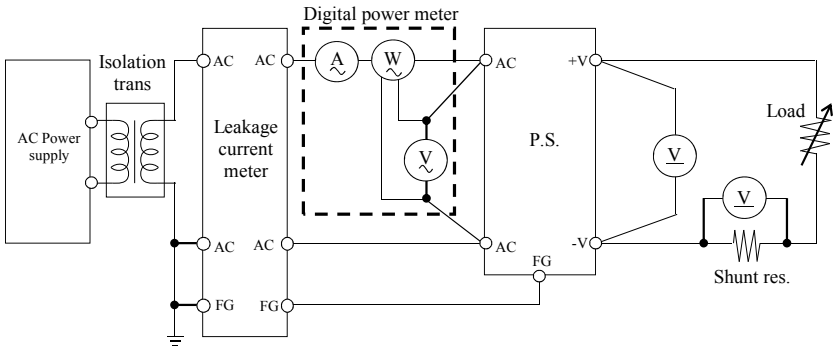
測定回路3 Circuit 3 used for determination

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



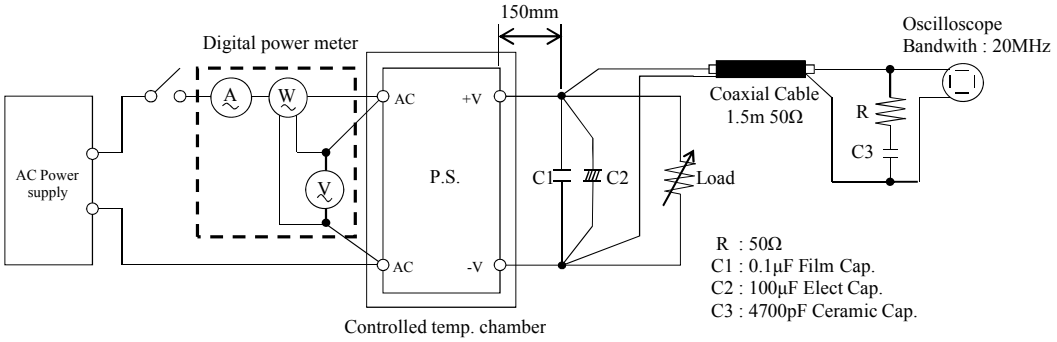
測定回路4 Circuit 4 used for determination

・リーク電流特性　 Leakage current characteristics



測定回路5 Circuit 5 used for determination

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

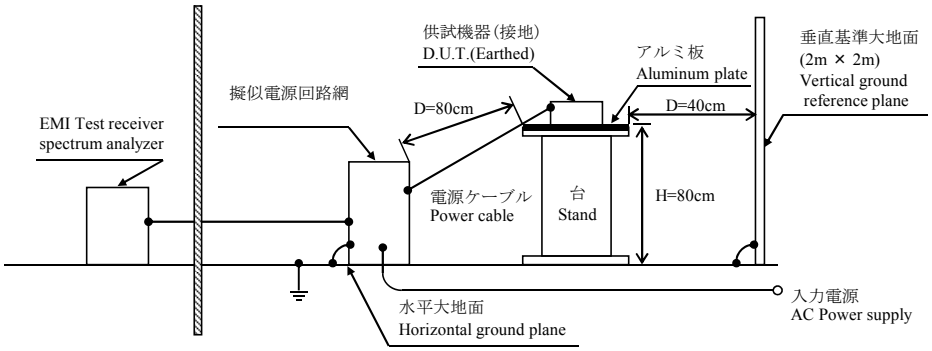


測定構成　Configuration used for determination

・EMI特性　　Electro-Magnetic Interference characteristics

雑音端子電圧 (帰還ノイズ)

Conducted Emission



1.2 使用測定機器　　List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DL1740 / DL9040L / DLM2054
2	DIGITAL MULTIMETER	AGILENT	34970A
3	DIGITAL POWER METER	YOKOGAWA ELECT.	WT210
4	CONTROLLED TEMP. CHAMBER	ESPEC	SH-240S1
5	DYNAMIC DUMMY LOAD	TAKASAGO	FK-200L / FK-400L
6	DUMMY LOAD	PCN	PHF250 SERIES
7	CURRENT PROBE	YOKOGAWA ELECT.	701928 / 701930
8	AC POWER SUPPLY	TAKASAGO	AA2000XG
9	AC POWER SUPPLY	KIKUSUI	PCR2000L / PCR4000L
10	SHUNT RESISTOR	YOKOGAWA	MODEL 2215
11	SHUNT RESISTOR	DAIICHI ELECT.	TYPE DS
12	LEAKAGE CURRENT METER	HIOKI	3156
13	DYNAMIC DIP SIMULATOR	TAKAMISAWA	PSA-210
14	ISOLATION TRANS	TOYO ELECT.	LCC-B-1000
15	SLIDE REGULATOR	MATSUNAGA	SD-2450
16	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESCI3
17	PRE AMP.	HEWLETT-PACKARD	8447D OPT 010
18	AMN	SCHWARZBECK	NNLK8121
19	ANTENNA	SCHWARZBECK	BBA9106 / UHALP9107

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

・測定条件 Measuring Condition : 出力電圧、電流 Output voltage & current

Iout \ Vout	V1 : 5V	V2 : 12V	V3 : -12V
Min Load	0.5A	0.0A	0.0A
100%	3.0A	1.2A	0.3A

1. Regulation - line and load　Condition　Ta :　25 °C

V1 : 5V

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	Line regulation	
Min Load	5.006V	5.006V	5.006V	5.006V	0mV	0.000%
50%	4.991V	4.991V	4.992V	4.992V	1mV	0.020%
100%	4.976V	4.976V	4.976V	4.976V	0mV	0.000%
Load	30mV	30mV	30mV	30mV		
regulation	0.600%	0.600%	0.600%	0.600%		

V2 : 12V

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	Line regulation	
Min Load	11.916V	11.915V	11.915V	11.915V	1mV	0.008%
50%	11.919V	11.918V	11.918V	11.918V	1mV	0.008%
100%	11.922V	11.921V	11.921V	11.921V	1mV	0.008%
Load	6mV	6mV	6mV	6mV		
regulation	0.050%	0.050%	0.050%	0.050%		

V3 : -12V

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	Line regulation	
Min Load	-12.122V	-12.122V	-12.122V	-12.122V	0mV	0.000%
50%	-12.127V	-12.127V	-12.127V	-12.127V	0mV	0.000%
100%	-12.131V	-12.132V	-12.131V	-12.132V	1mV	0.008%
Load	9mV	10mV	9mV	10mV		
regulation	0.075%	0.083%	0.075%	0.083%		

2. Temperature drift　Conditions　Vin :　100 VAC
Iout :　100 %

V1 : 5V

Ta	-10℃	+25℃	+50℃	Temperature stability	
Vout	4.954V	4.976V	4.982V	28mV	0.560%

V2 : 12V

Ta	-10℃	+25℃	+50℃	Temperature stability	
Vout	11.871V	11.921V	11.939V	68mV	0.567%

V3 : -12V

Ta	-10℃	+25℃	+50℃	Temperature stability	
Vout	-12.117V	-12.132V	-12.141V	24mV	0.200%

3. Start up voltage and Drop out voltage　Conditions　Ta :　25 °C
Iout :　100 %

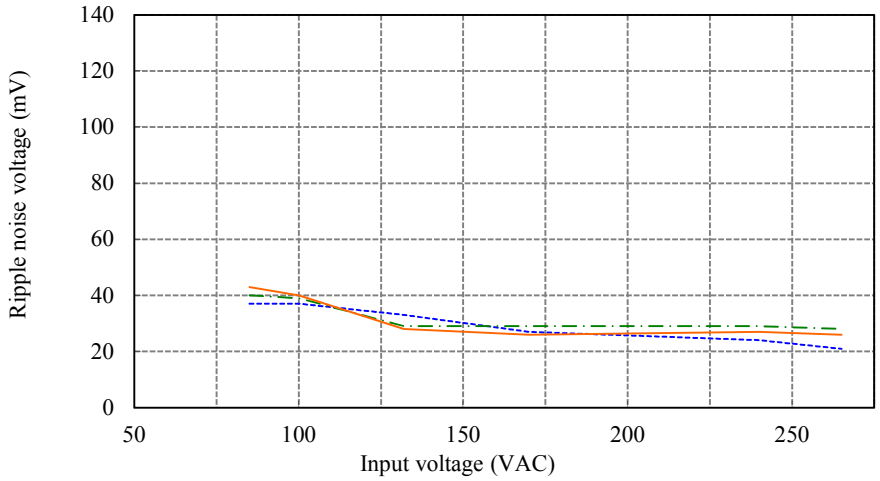
Start up voltage (Vin)	59VAC
Drop out voltage (Vin)	56VAC

(2) リップルノイズ電圧対入力電圧

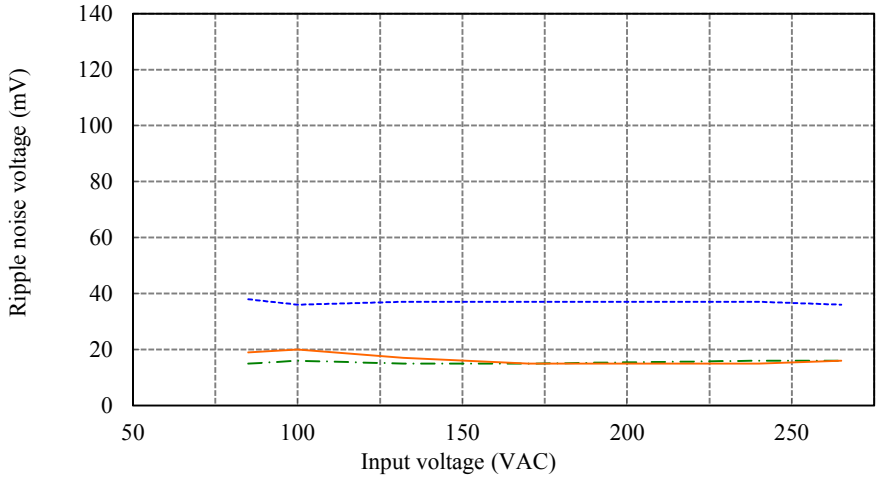
Ripple noise voltage vs. Input voltage

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

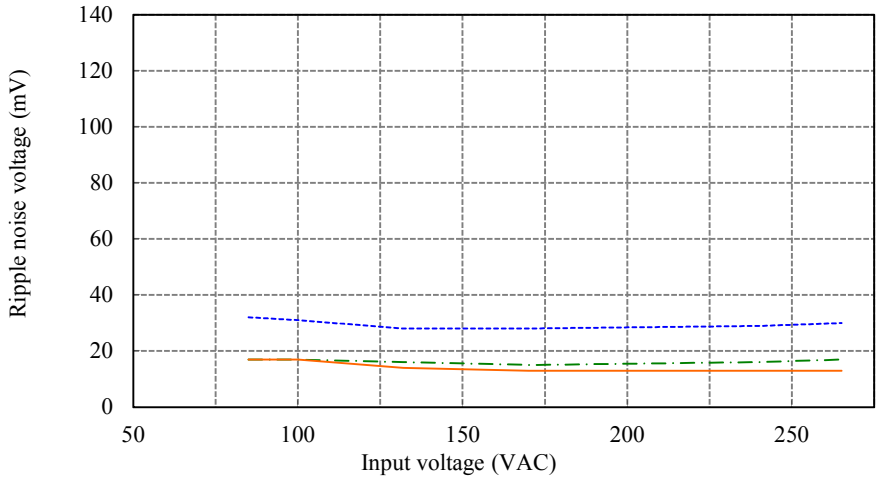
V1 : 5V



V2 : 12V



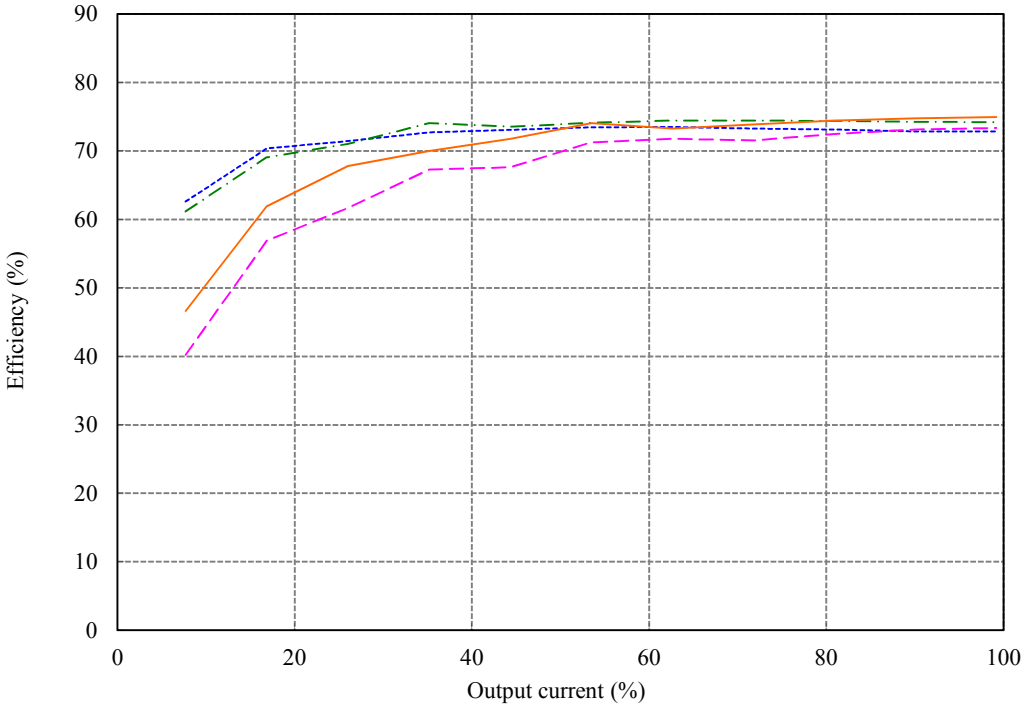
V3 : -12V

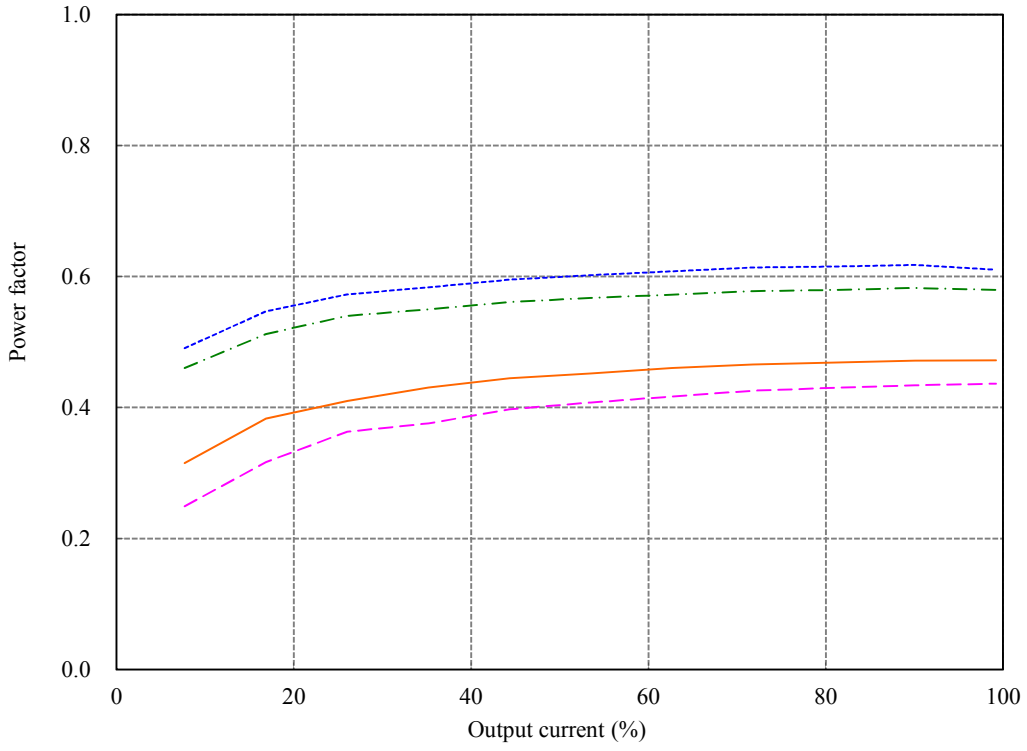


(3) 効率・力率対出力電流

Efficiency and Power factor vs. Output current

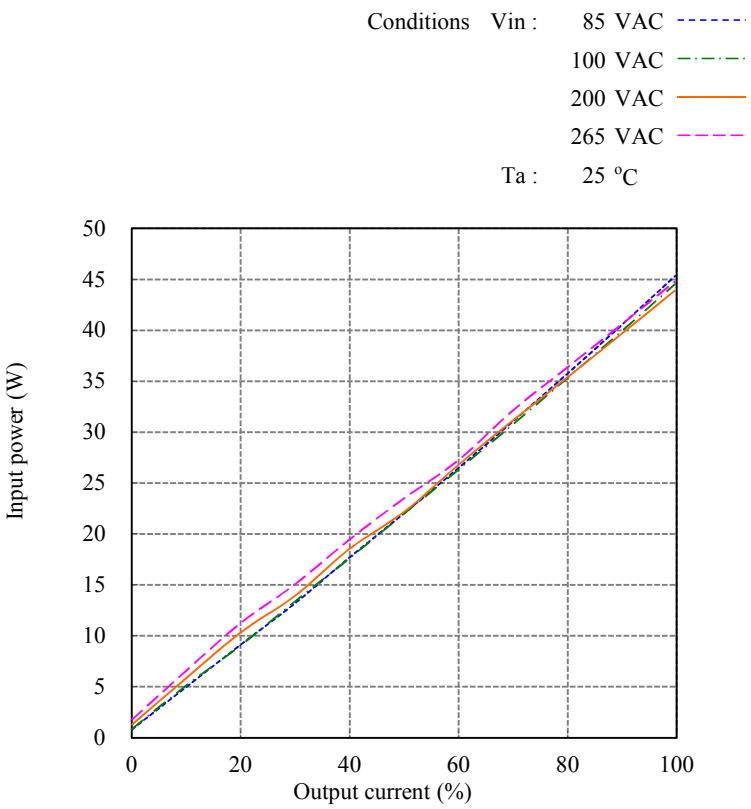
Conditions Vin : 85 VAC
100 VAC
200 VAC
265 VAC
Ta : 25 °C





(4) 入力電力対出力電流

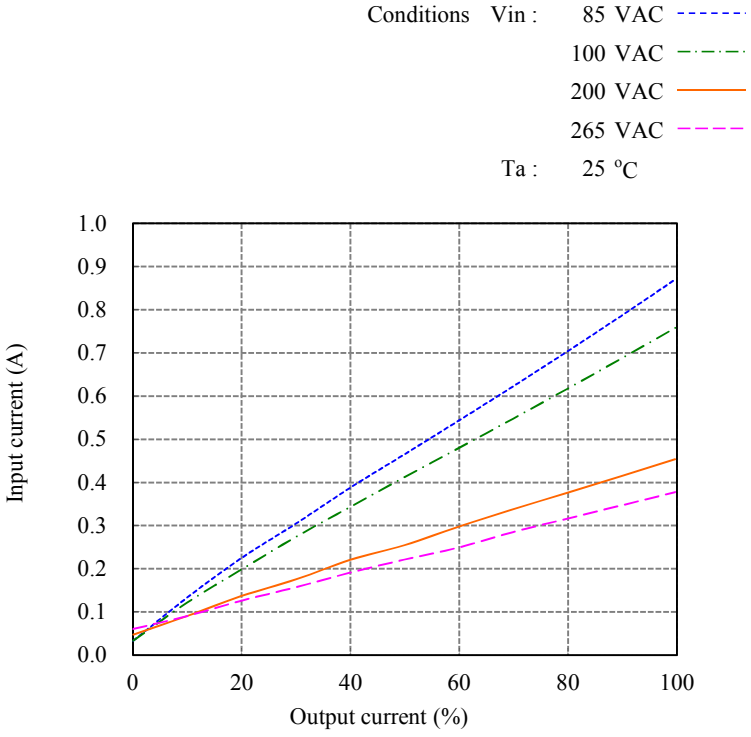
Input power vs. Output current



Vin	Input power
	Iout : 0%
85VAC	0.82W
100VAC	0.87W
200VAC	1.30W
265VAC	1.78W

(5) 入力電流対出力電流

Input current vs. Output current



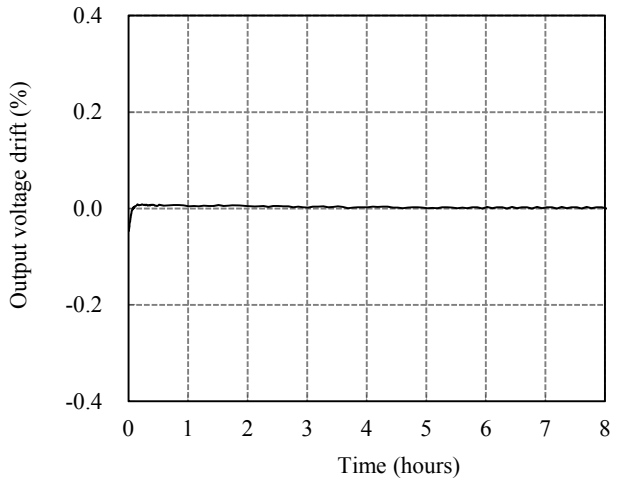
Vin	Input current
	Iout : 0%
85VAC	0.03A
100VAC	0.03A
200VAC	0.05A
265VAC	0.06A

2.2 通電ドリフト特性

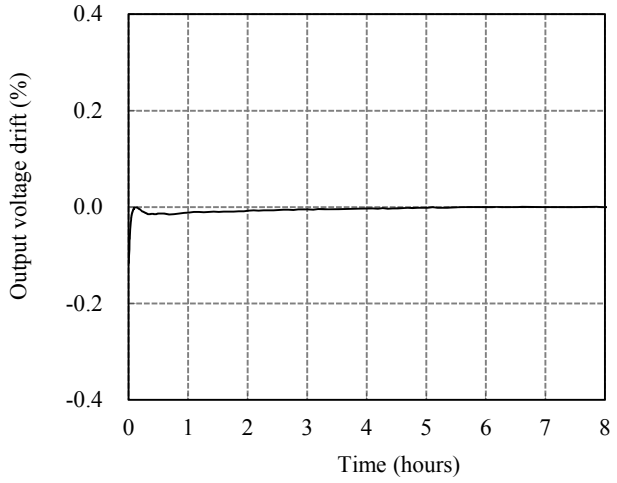
Warm up voltage drift characteristics

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

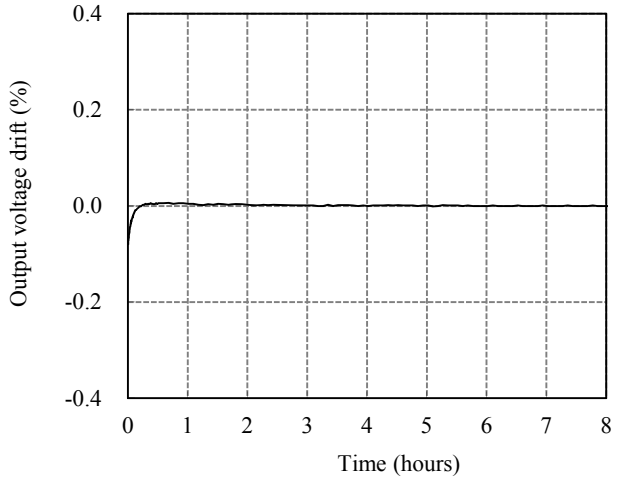
V1 : 5V



V2 : 12V



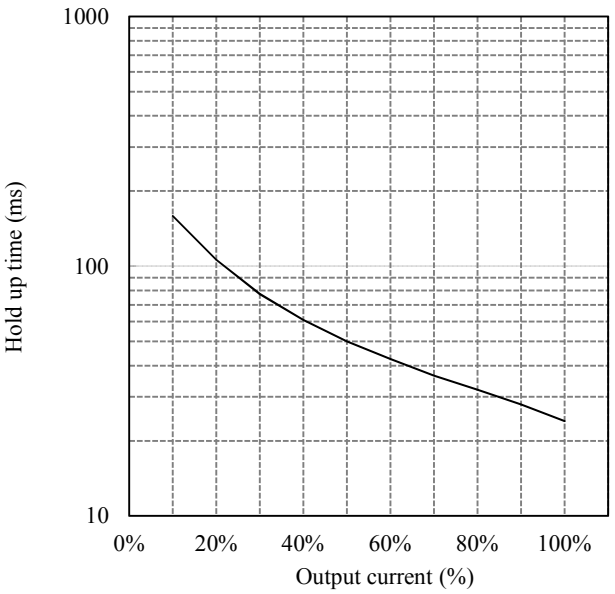
V3 : -12V



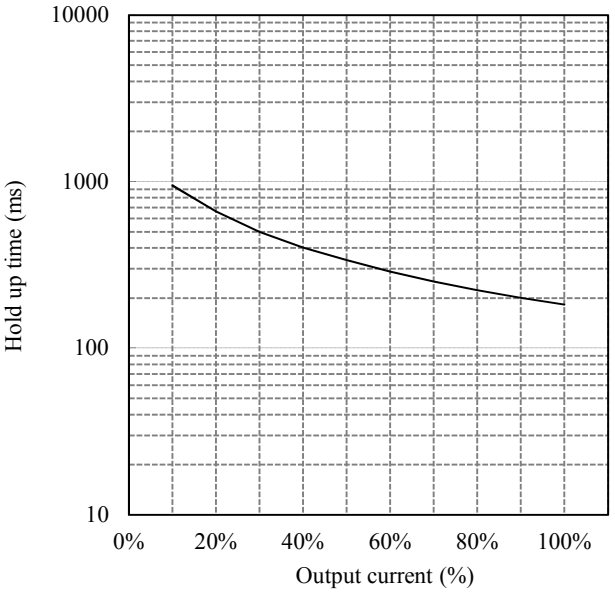
2.3 出力保持時間特性

Hold up time characteristics

Conditions Vin : 100 VAC
Ta : 25 °C



Conditions Vin : 240 VAC
Ta : 25 °C



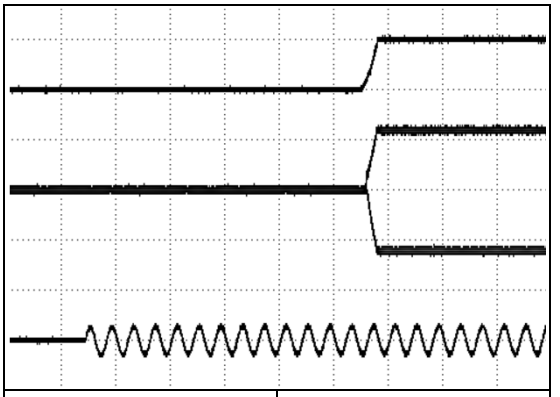
2.4 出力立ち上がり特性

Output rise characteristics

Conditions Ta : 25 °C

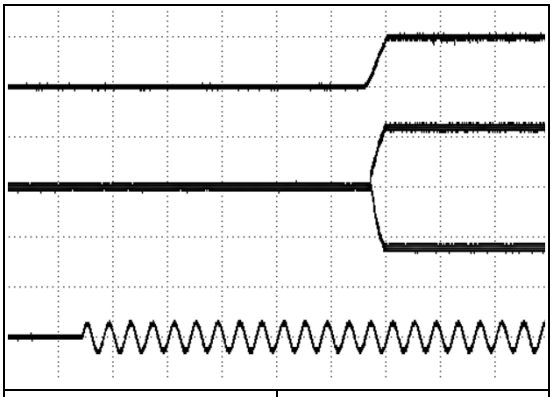
Vin = 100VAC

Iout : 0%

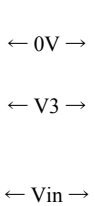


V1 :	+5V	5V/DIV
V2 :	+12V	10V/DIV
V3 :	-12V	10V/DIV
Time		50ms/DIV

Iout : 100%

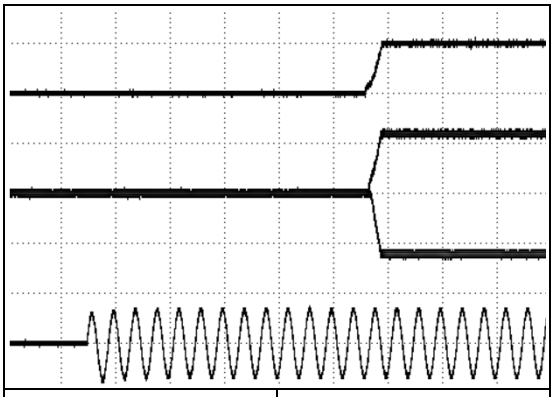


V1 :	+5V	5V/DIV
V2 :	+12V	10V/DIV
V3 :	-12V	10V/DIV
Time		50ms/DIV



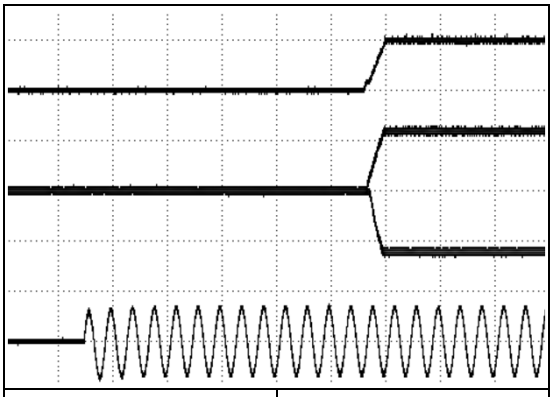
Vin = 240VAC

Iout : 0%

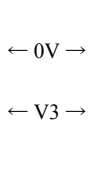


V1 :	+5V	5V/DIV
V2 :	+12V	10V/DIV
V3 :	-12V	10V/DIV
Time		50ms/DIV

Iout : 100%



V1 :	+5V	5V/DIV
V2 :	+12V	10V/DIV
V3 :	-12V	10V/DIV
Time		50ms/DIV



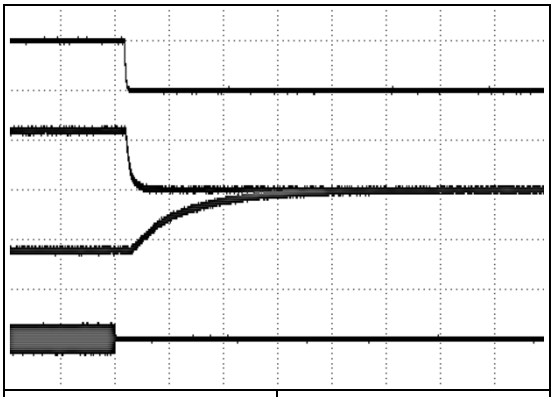
2.5 出力立ち下がり特性

Output fall characteristics

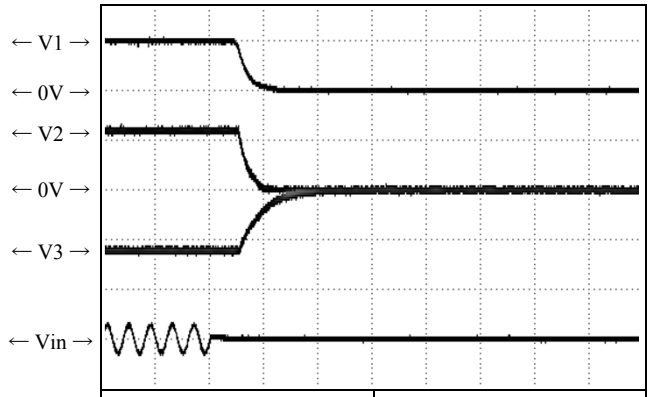
Conditions Ta : 25 ºC

Vin = 100VAC

Iout : 0%



V1 :	+5V	5V/DIV
V2 :	+12V	10V/DIV
V3 :	-12V	10V/DIV
Time		2s/DIV

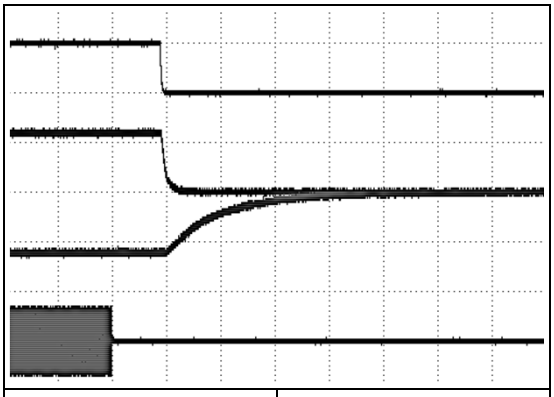


Iout : 100%

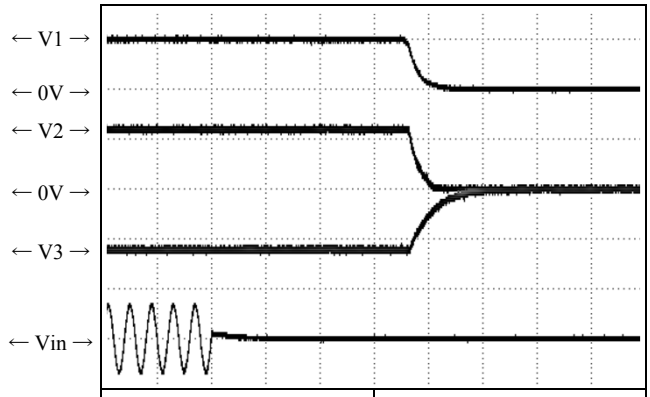
V1 :	+5V	5V/DIV
V2 :	+12V	10V/DIV
V3 :	-12V	10V/DIV
Time		50ms/DIV

Vin = 240VAC

Iout : 0%



V1 :	+5V	5V/DIV
V2 :	+12V	10V/DIV
V3 :	-12V	10V/DIV
Time		2s/DIV



Iout : 100%

V1 :	+5V	5V/DIV
V2 :	+12V	10V/DIV
V3 :	-12V	10V/DIV
Time		50ms/DIV

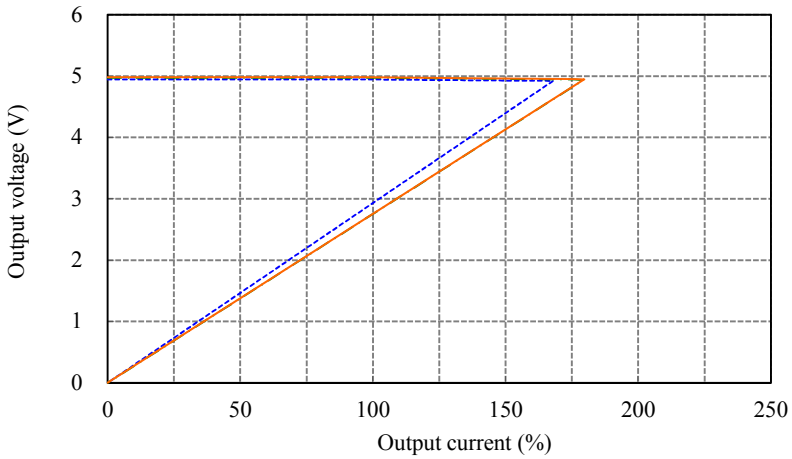
2.6 過電流保護特性

Over current protection (OCP) characteristics

Conditions Vin : 100 VAC
Ta : -10 °C
25 °C
50 °C

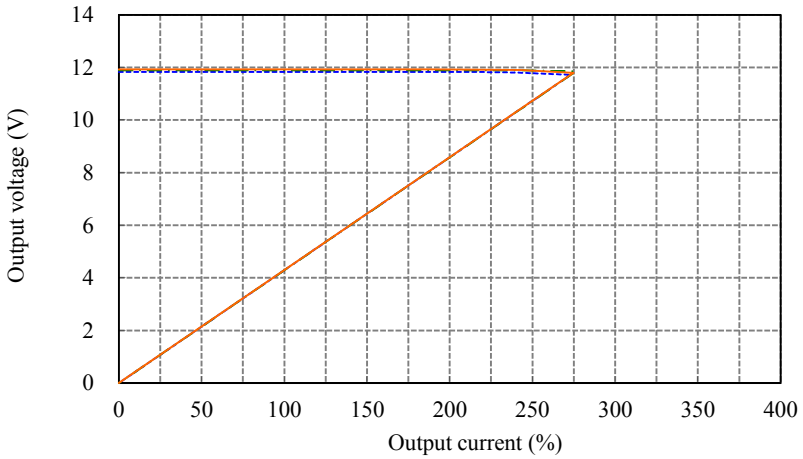
V1 : 5V

V2, V3 : Io = 100%



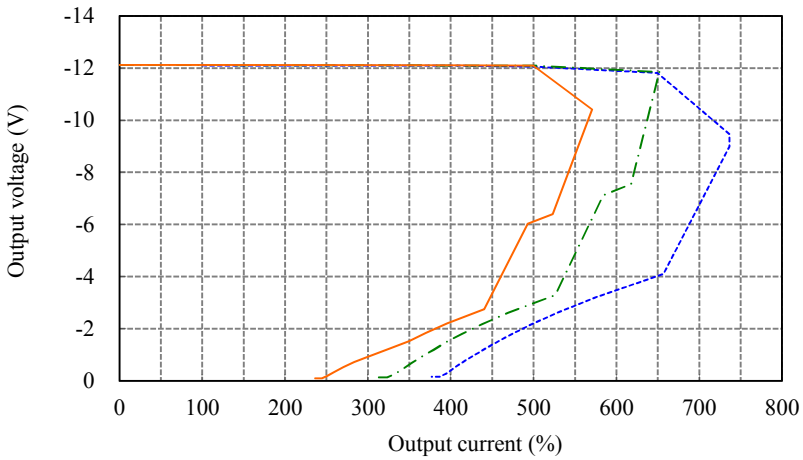
V2 : 12V

V1: Io = Min Load, V3: Io = 0%



V3 : -12V

V1: Io = Min Load, V2: Io = 0%



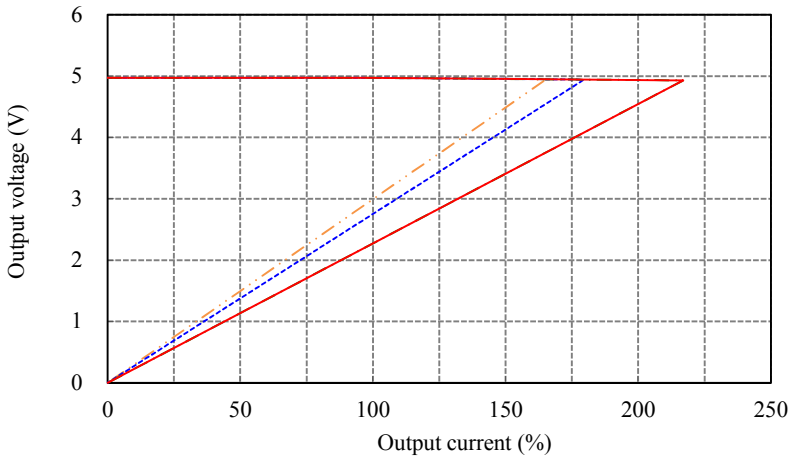
2.6 過電流保護特性

Over current protection (OCP) characteristics

Conditions Vin : 85 VAC
100 VAC
240 VAC
265 VAC
Ta : 25 °C

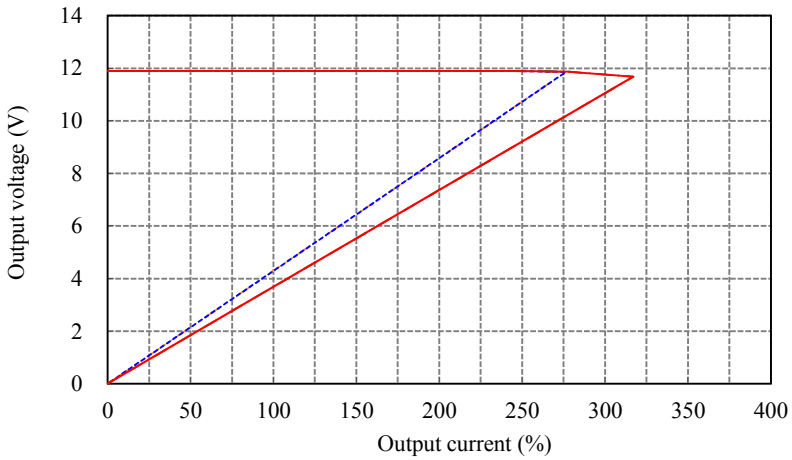
V1 : 5V

V2, V3 : Io = 100%



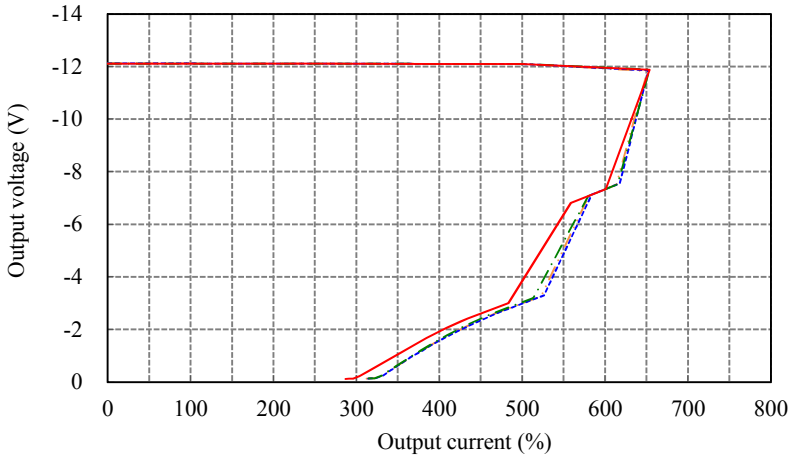
V2 : 12V

V1: Io = Min Load, V3: Io= 0%



V3 : -12V

V1: Io = Min Load, V2: Io = 0%

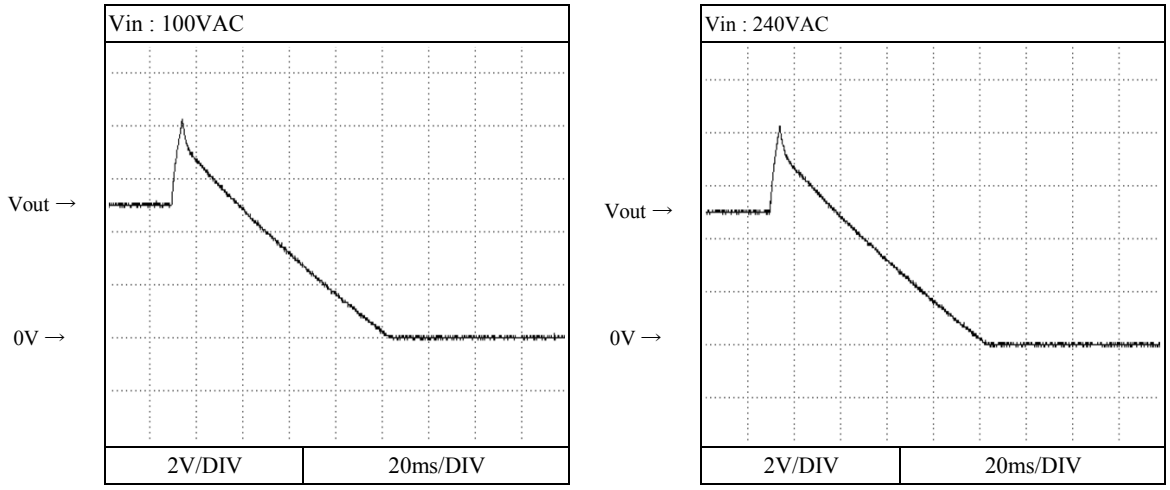


2.7 過電圧保護特性

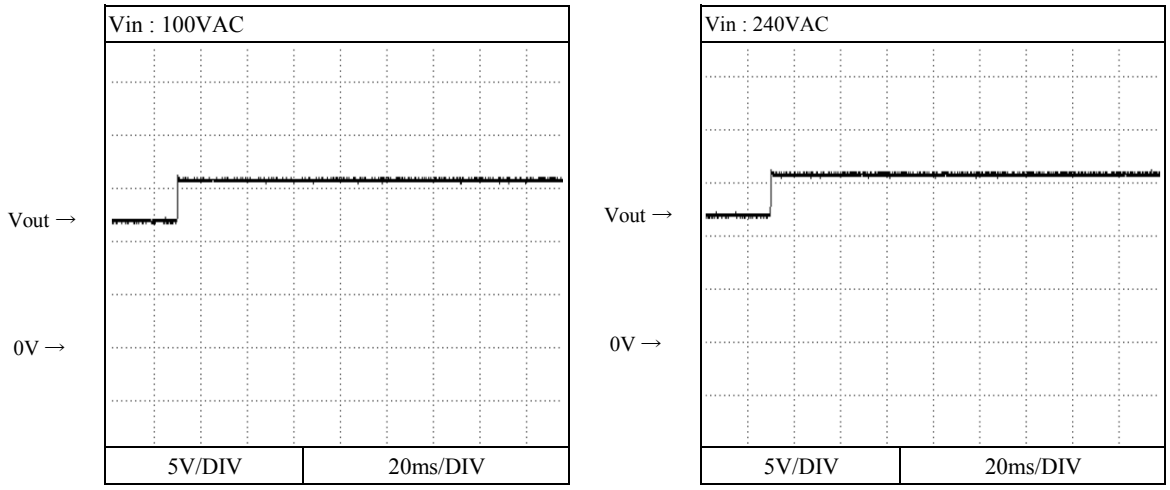
Over voltage protection (OVP) characteristics

Conditions Ta : 25 °C

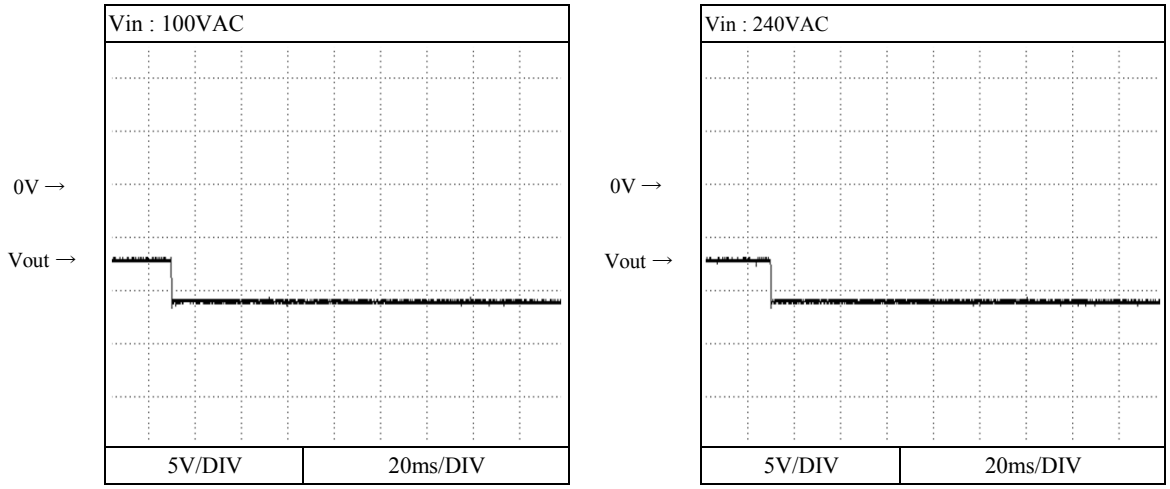
V1 : 5V Open Sense 5V : Io = 10%, 12V : Io = 0%, -12V : Io = 0%



V2 : 12V IC53 : In - Out Short 5V : Io = 100%, 12V : Io = 0%, -12V : Io = 0%



V3 : -12V IC54 : In - Out Short 5V : Io = 100%, 12V : Io = 0%, -12V : Io = 0%



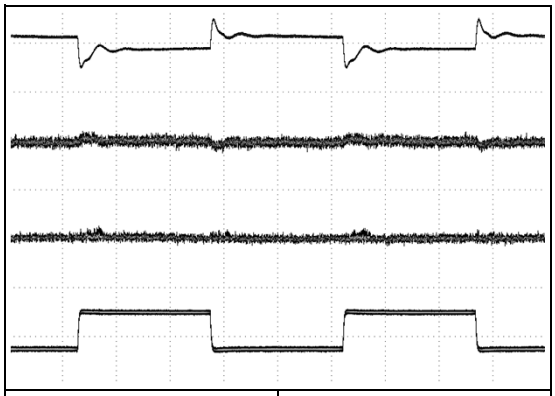
2.9 過渡応答（負荷急変）特性

Dynamic load response characteristics

Conditions Vin : 100 VAC
Ta : 25 °C

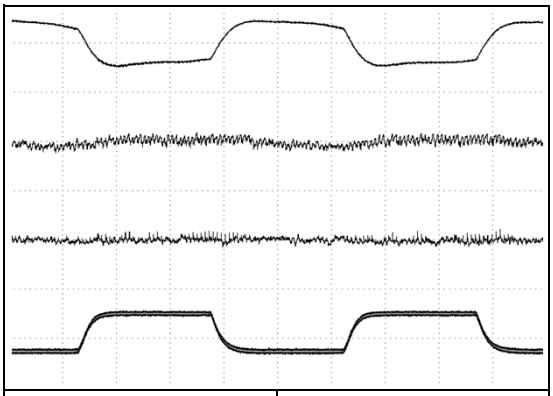
V1 : 5V　Io (V1) : 50% ⟷ 100%　(tr = tf = 50μs)　Io (V2) : 100%　Io (V3) : 100%

f = 100Hz



V1 : 200mV/DIV	Time : 2ms/DIV	
V2 : 20mV/DIV	⊿V1	+2.04%
V3 : 20mV/DIV		-2.06%

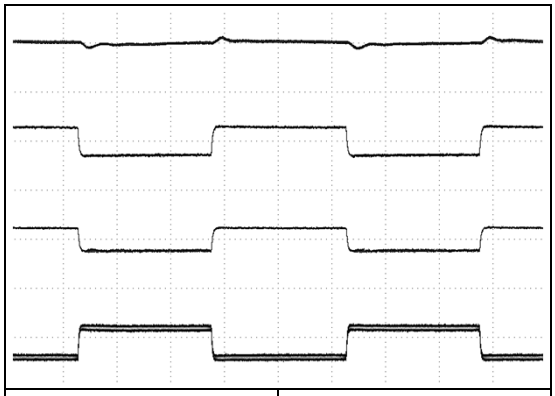
f = 1kHz



V1 : 200mV/DIV	Time : 200μs/DIV	
V2 : 20mV/DIV	⊿V1	+1.90%
V3 : 20mV/DIV		-1.96%

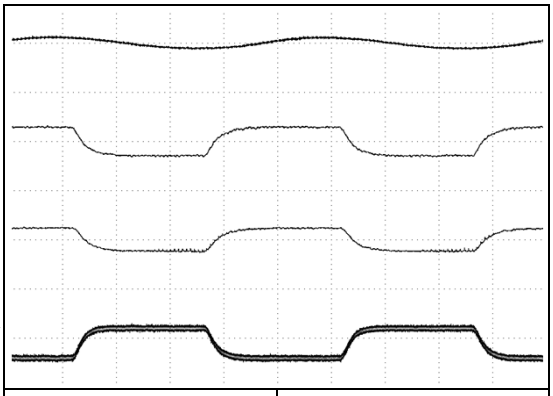
V2 : 12V　Io (V1) : 100%　Io (V2) : 50% ⟷ 100%　(tr = tf = 50μs)　Io (V3) : 100%

f = 100Hz



V1 : 200mV/DIV	Time : 2ms/DIV	
V2 : 100mV/DIV	⊿V2	+0.28%
V3 : 100mV/DIV		-0.28%

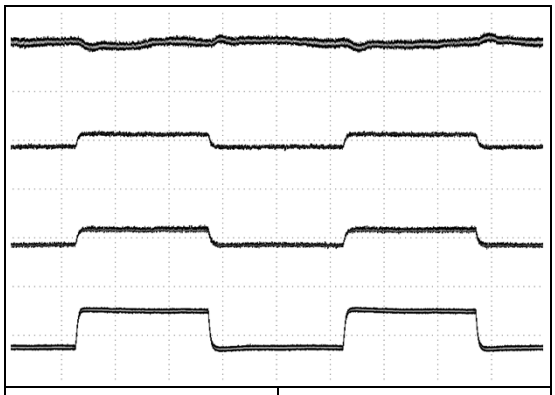
f = 1kHz



V1 : 200mV/DIV	Time : 200μs/DIV	
V2 : 100mV/DIV	⊿V2	+0.28%
V3 : 100mV/DIV		-0.27%

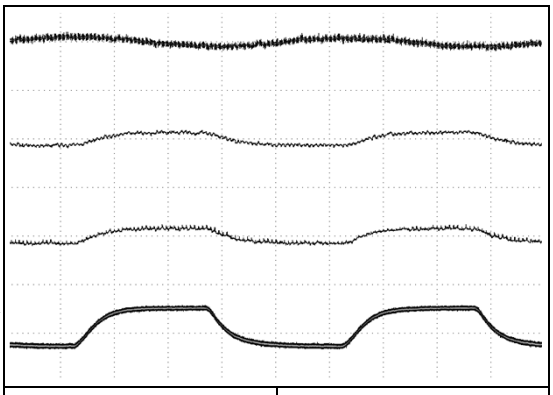
V3 : -12V　Io (V1) : 100%　Io (V2) : 100%　Io (V3) : 50% ⟷ 100%　(tr = tf = 50μs)

f = 100Hz



V1 : 50mV/DIV	Time : 2ms/DIV	
V2 : 50mV/DIV	⊿V3	+0.11%
V3 : 50mV/DIV		-0.10%

f = 1kHz



V1 : 50mV/DIV	Time : 200μs/DIV	
V2 : 50mV/DIV	⊿V3	+0.10%
V3 : 50mV/DIV		-0.08%

2.10 入力電圧瞬停特性

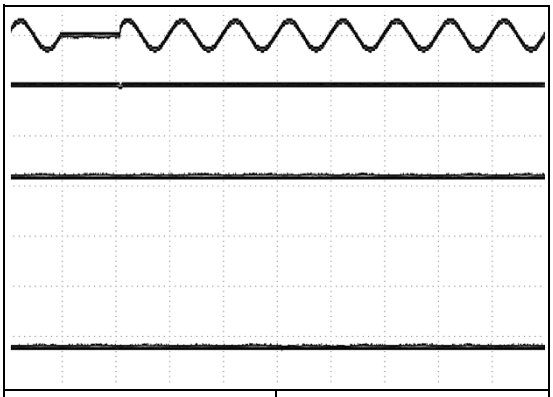
Response to brown out characteristics

Conditions Iout : 100 %

Ta : 25 °C

Vin = 100VAC

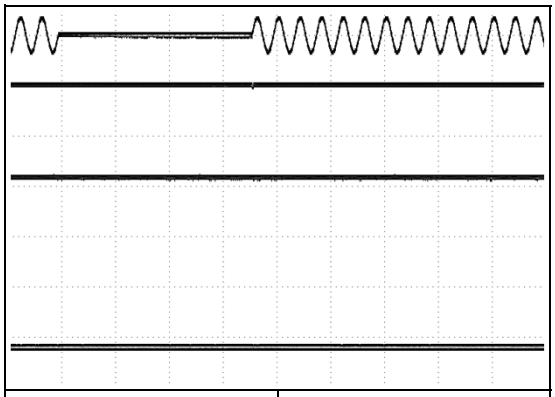
t = 22ms



V1 : +5V	5V/DIV
V2 : +12V	10V/DIV
V3 : -12V	10V/DIV
Time	20ms/DIV

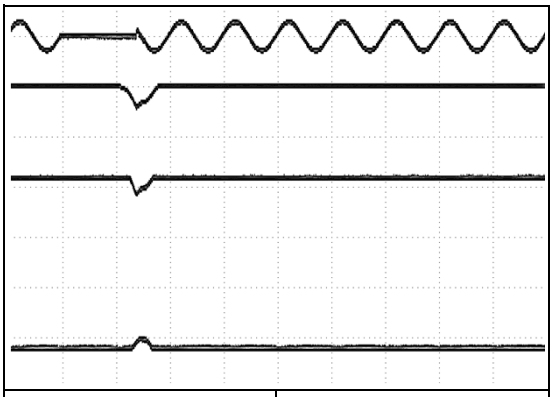
Vin = 240VAC

t = 180ms



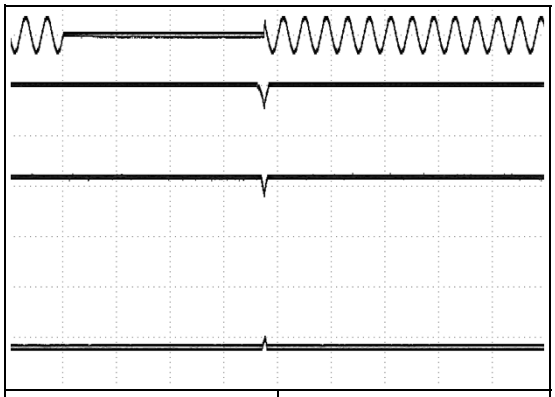
V1 : +5V	5V/DIV
V2 : +12V	10V/DIV
V3 : -12V	10V/DIV
Time	50ms/DIV

t = 28ms



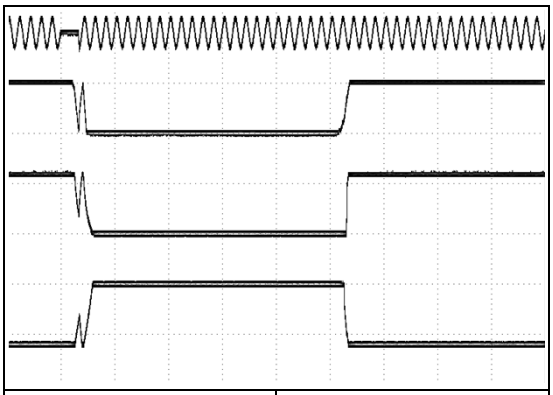
V1 : +5V	5V/DIV
V2 : +12V	10V/DIV
V3 : -12V	10V/DIV
Time	20ms/DIV

t = 187ms



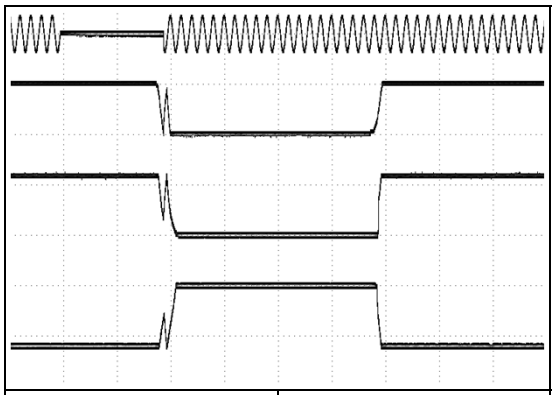
V1 : +5V	5V/DIV
V2 : +12V	10V/DIV
V3 : -12V	10V/DIV
Time	50ms/DIV

t = 34ms



V1 : +5V	5V/DIV
V2 : +12V	10V/DIV
V3 : -12V	10V/DIV
Time	100ms/DIV

t = 192ms



V1 : +5V	5V/DIV
V2 : +12V	10V/DIV
V3 : -12V	10V/DIV
Time	100ms/DIV

2.11 入力サージ電流（突入電流）波形

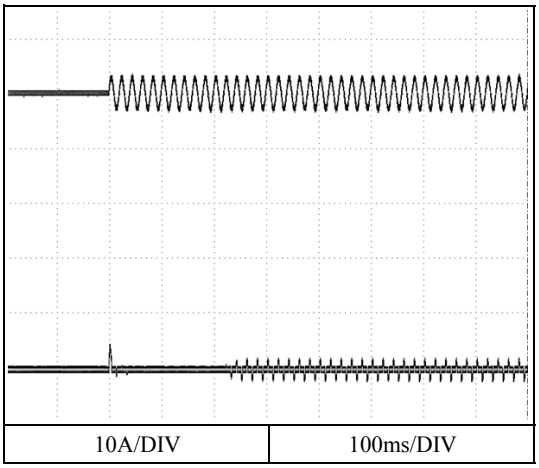
Inrush current waveform

Conditions Iout : 100 %

Ta : 25 ℃

Vin = 100VAC

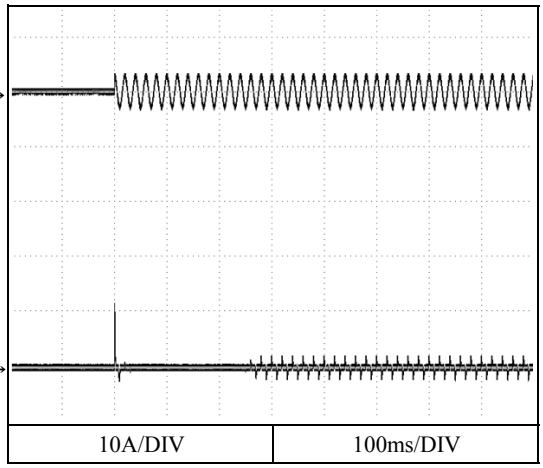
Switch on phase angle of input AC voltage
ϕ = 0°



← Vin →

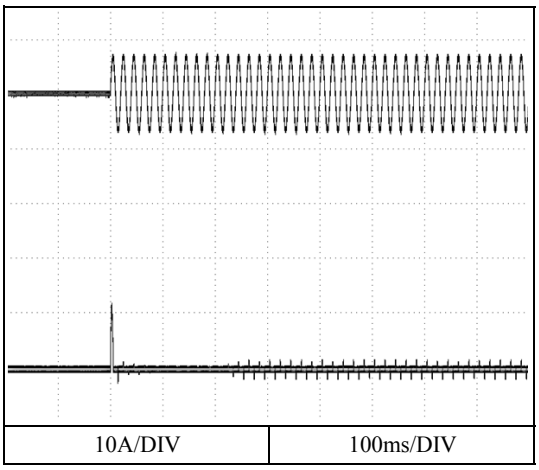
← Iin →

Switch on phase angle of input AC voltage
ϕ = 90°



Vin = 240VAC

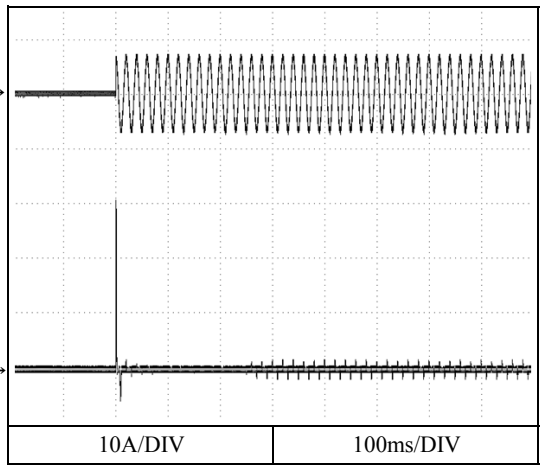
Switch on phase angle of input AC voltage
ϕ = 0°



← Vin →

← Iin →

Switch on phase angle of input AC voltage
ϕ = 90°

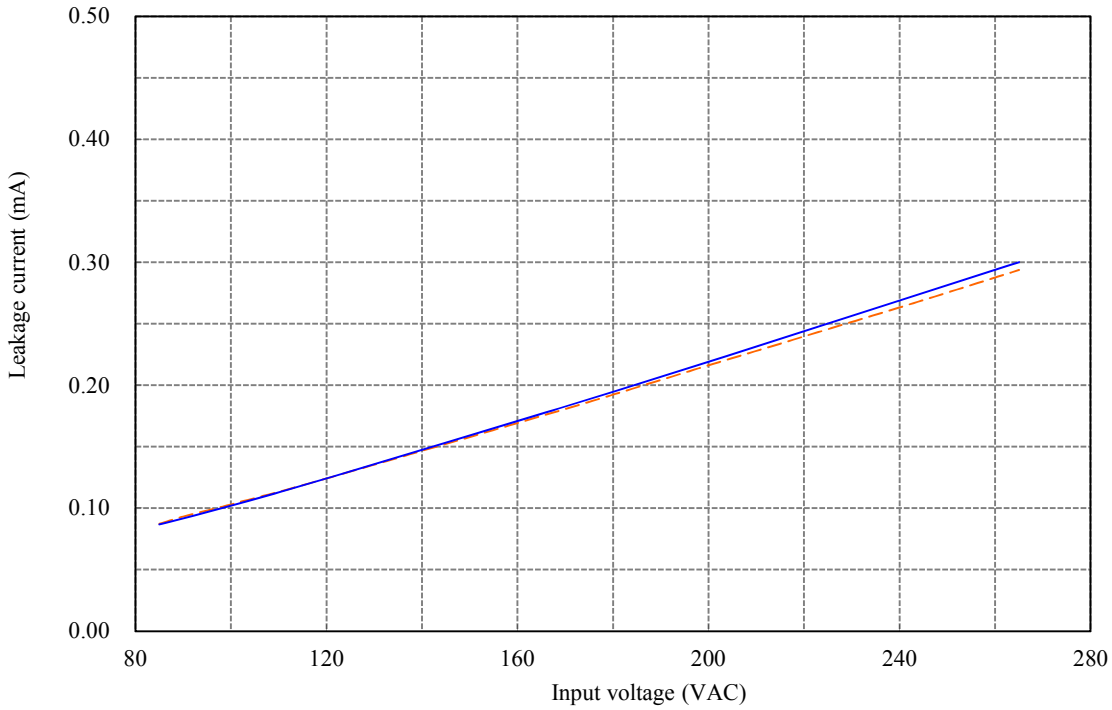


2.12 リーク電流特性

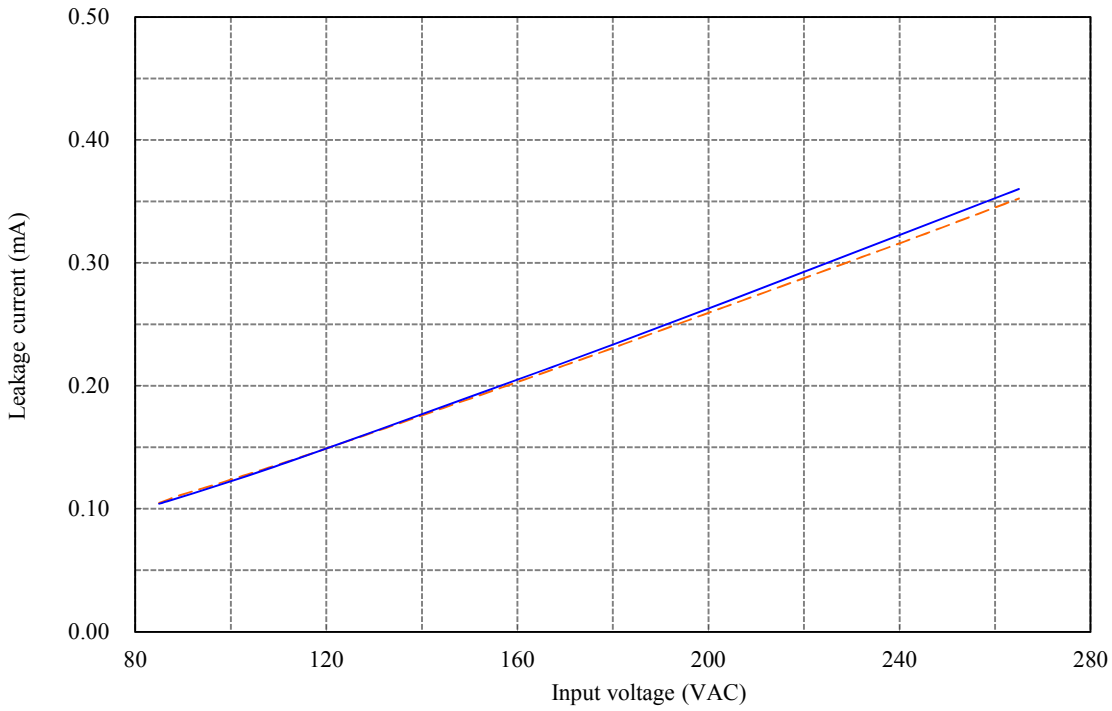
Leakage current characteristics

Conditions Iout : 0 %
100 %
Ta : 25 ºC
Equipment used : 3156 (HIOKI)

f : 50 Hz



f : 60 Hz



2.13 出力リップル、ノイズ波形

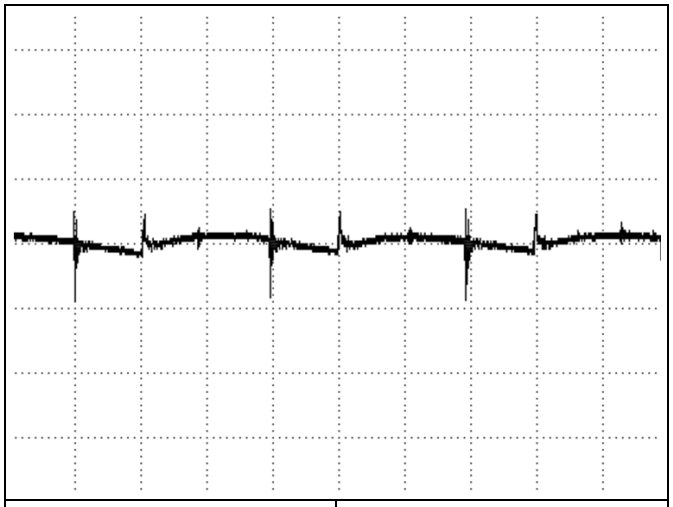
Output ripple and noise waveform

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

V1 : 5V

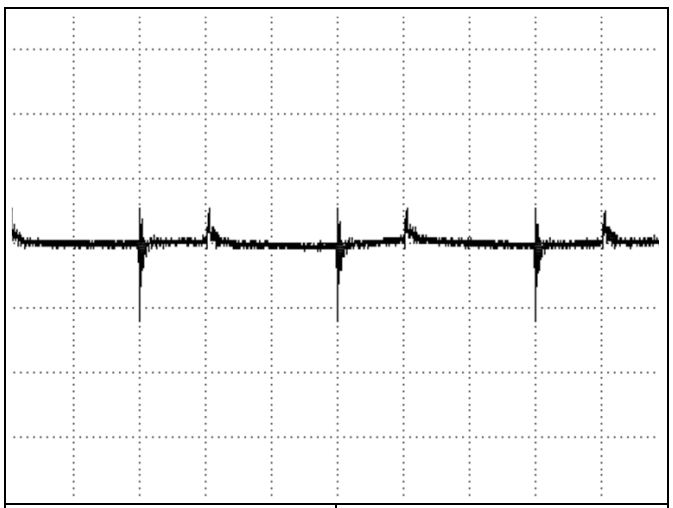
10mV/DIV	5μs/DIV

V2 : 12V



10mV/DIV	5μs/DIV

V3 : -12V



10mV/DIV	5μs/DIV

2.14 ＥＭＩ特性

Electro-Magnetic Interference characteristics

Conditions Vin : 100 VAC
Iout : 100 %
Ta : 25 ºC

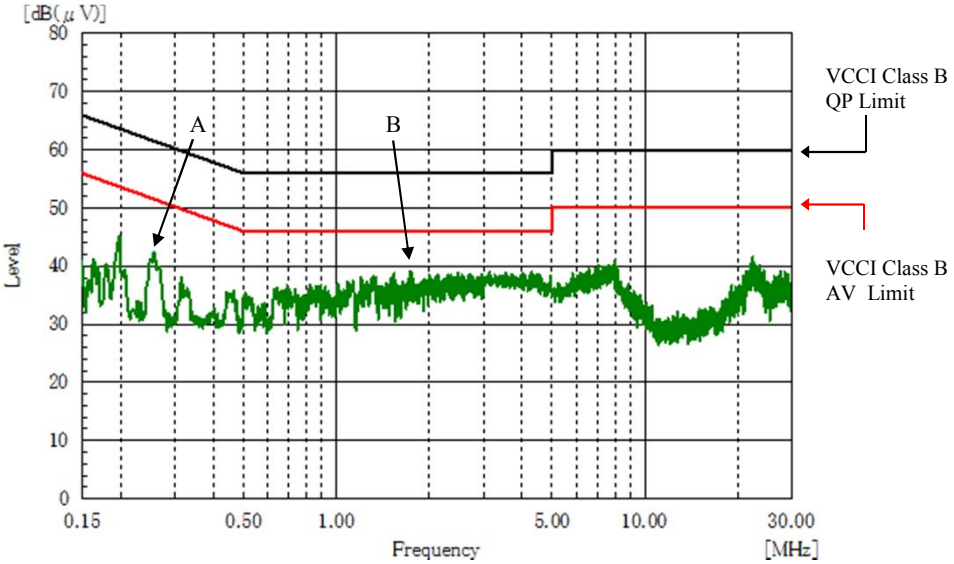
雑音端子電圧

Conducted Emission

Phase : N

Ref. Data	Point A (256kHz) Limit (dB)	Measure (dB)
QP	61.6	37.8
AV	51.6	30.9

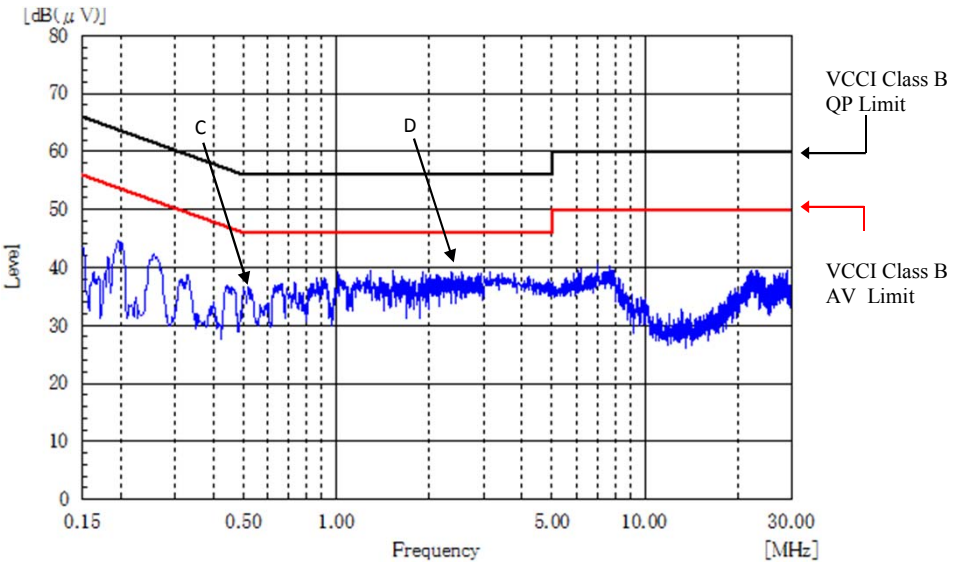
Ref. Data	Point B (1.75MHz) Limit (dB)	Measure (dB)
QP	56.0	33.8
AV	46.0	21.2



Phase : L

Ref. Data	Point C (534kHz) Limit (dB)	Measure (dB)
QP	56.0	33.0
AV	46.0	23.9

Ref. Data	Point D (2.55MHz) Limit (dB)	Measure (dB)
QP	56.0	35.1
AV	46.0	22.3



EN55011-B,EN55022-B,FCC-Bの限界値はVCCI class Bの限界値と同じ

Limit of EN55011-B,EN55022-B,FCC-B are same as its VCCI class B.

2.14 ＥＭＩ特性

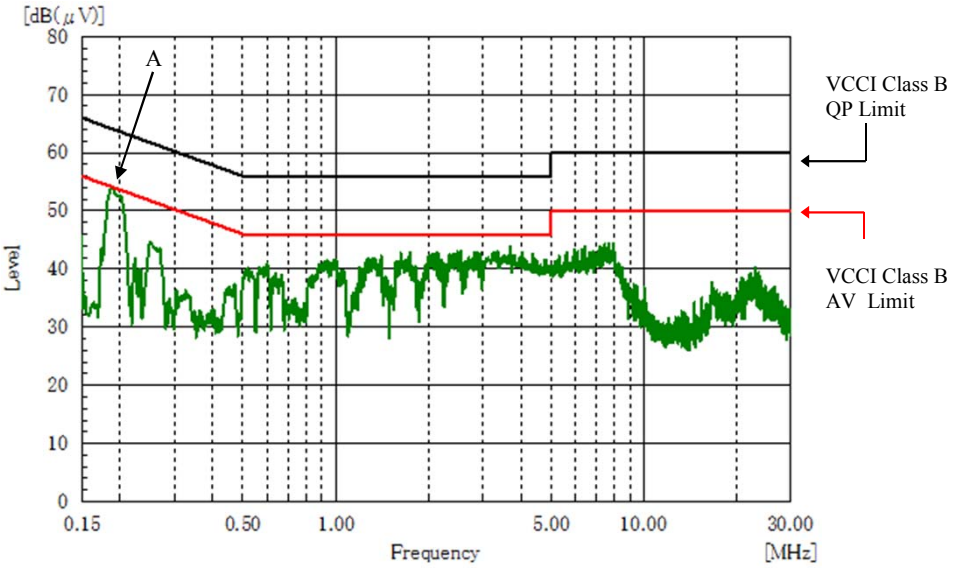
Electro-Magnetic Interference characteristics

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

雑音端子電圧

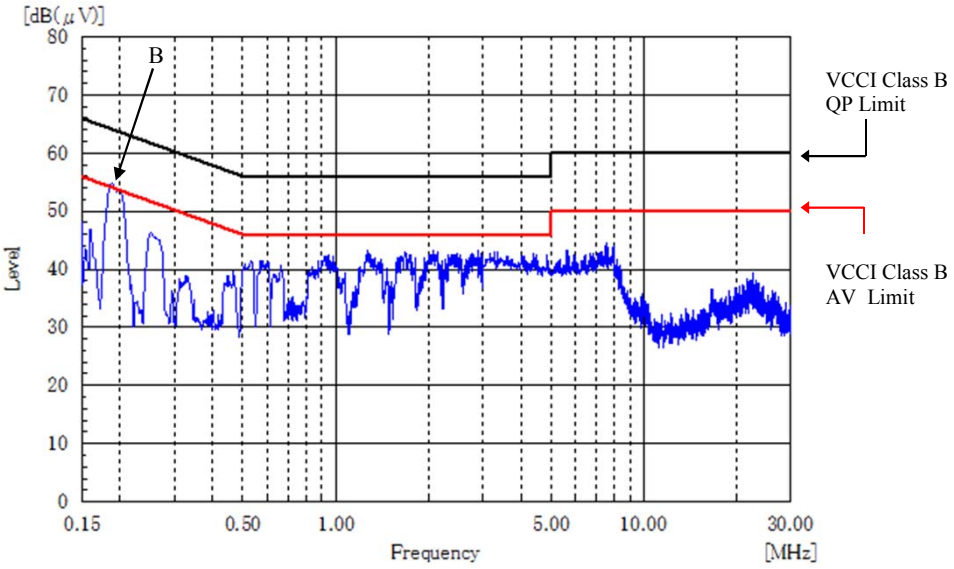
Conducted Emission

Phase : N



	Point A (188kHz)	
Ref. Data	Limit (dB)	Measure (dB)
QP	64.1	52.4
AV	54.1	43.0

Phase : L



	Point B (188kHz)	
Ref. Data	Limit (dB)	Measure (dB)
QP	64.1	53.3
AV	54.1	44.0

EN55011-B,EN55022-B,FCC-Bの限界値はVCCI class Bの限界値と同じ

Limit of EN55011-B,EN55022-B,FCC-B are same as its VCCI class B.