ZWS240RC

EVALUATION DATA

型式データ

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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

■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。

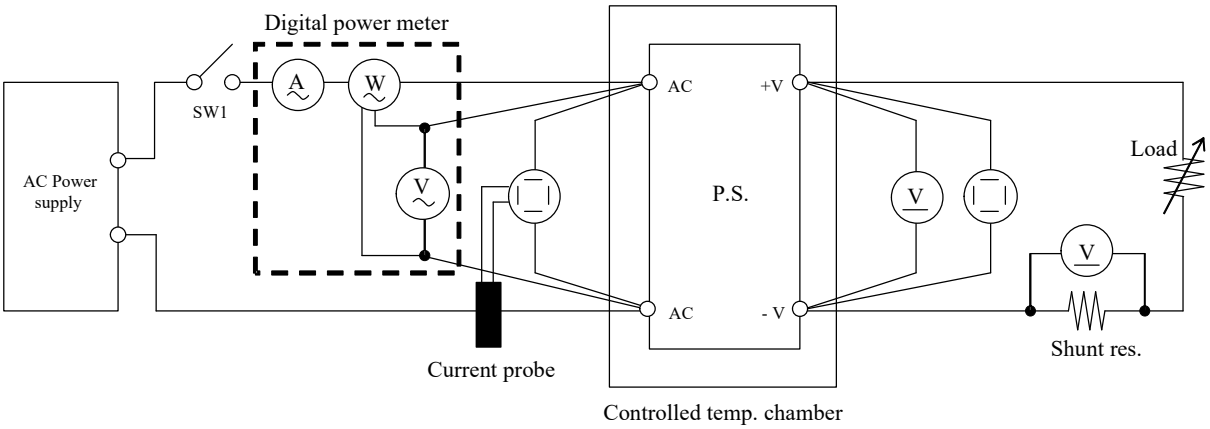
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

1-1. 測定回路 Circuit used for determination

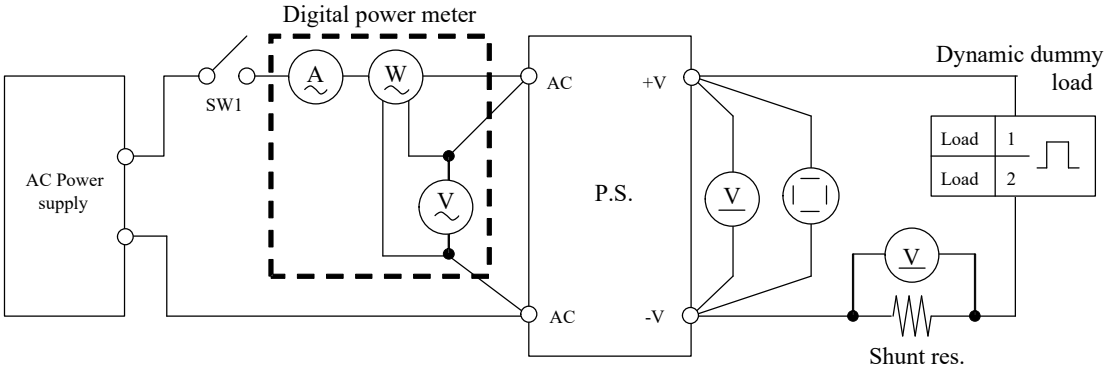
測定回路1 Circuit 1 used for determination

- 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
- 過電流保護特性 Over current protection (OCP) characteristics
- 過電圧保護特性 Over voltage protection (OVP) 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
- 入力電流波形 Input current waveform

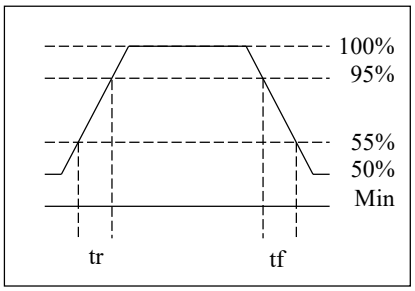


測定回路2 Circuit 2 used for determination

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

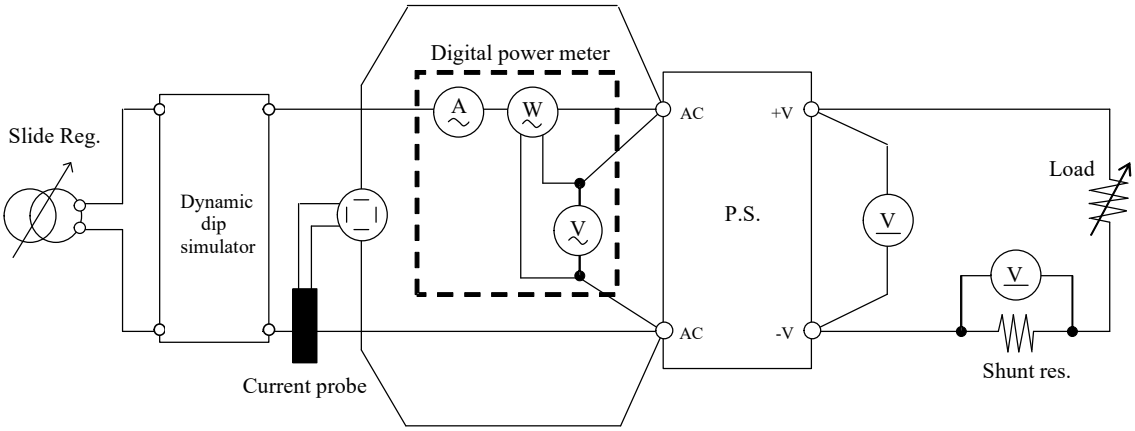


Output current waveform
Iout 50% <==> 100%



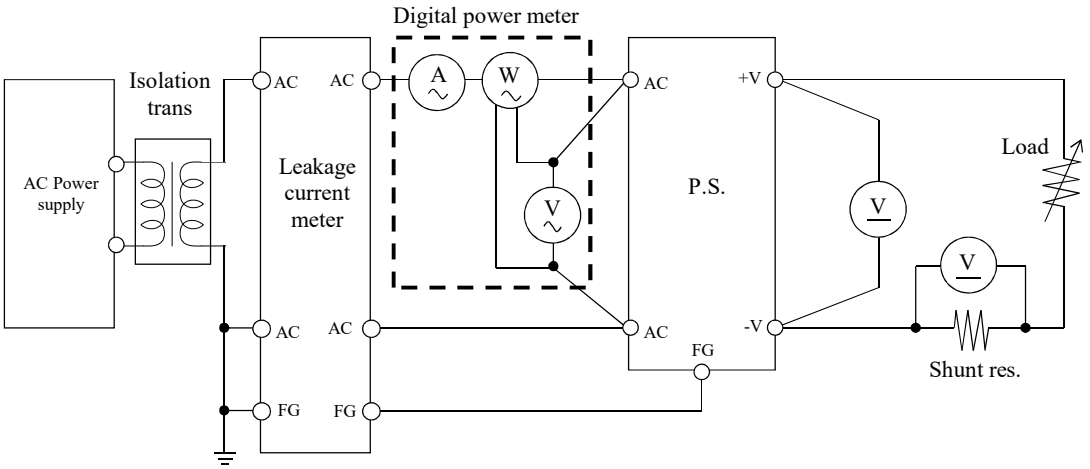
測定回路3　Circuit 3 used for determination

• 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

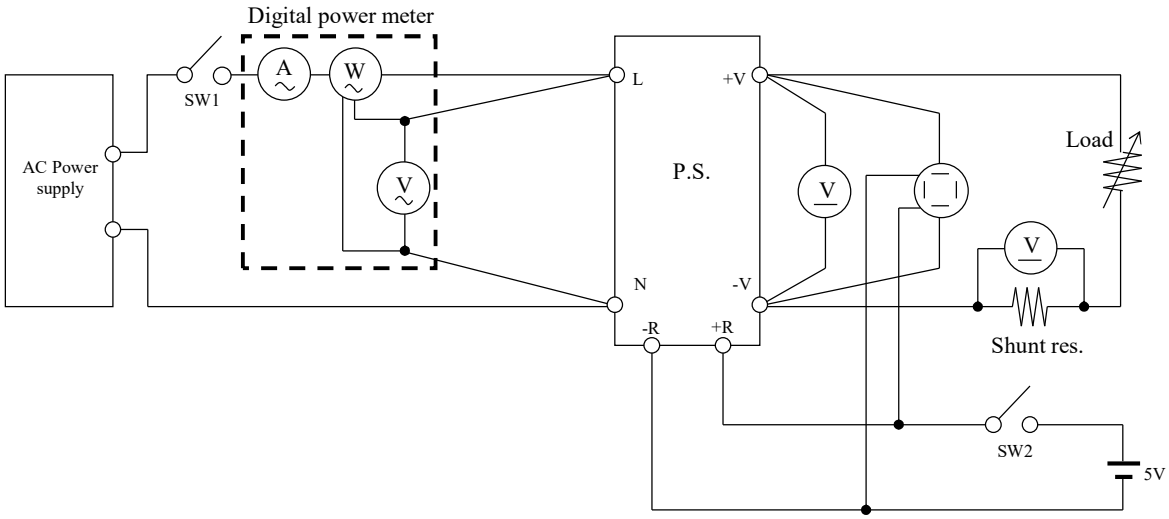


測定回路5　Circuit 5 used for determination

• ON/OFFコントロール時出力立ち上がり、立ち下がり特性

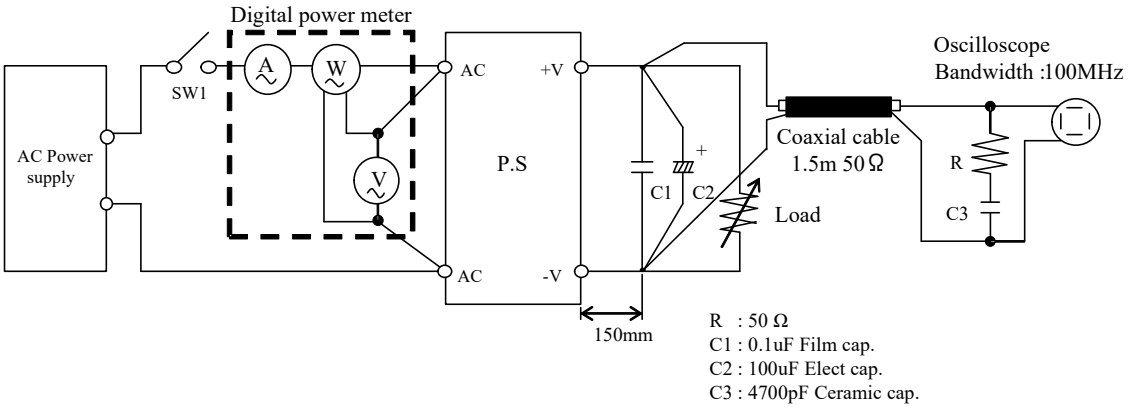
Output rise, fall characteristics with ON/OFF Control

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



測定回路6　Circuit 5 used for determination

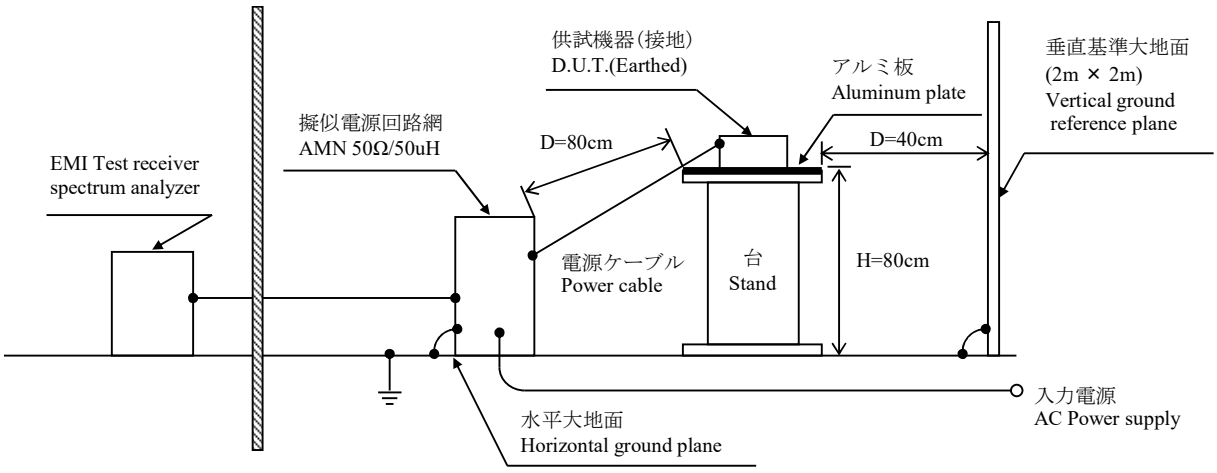
• 出力リップル、ノイズ波形　Output ripple and noise waveform



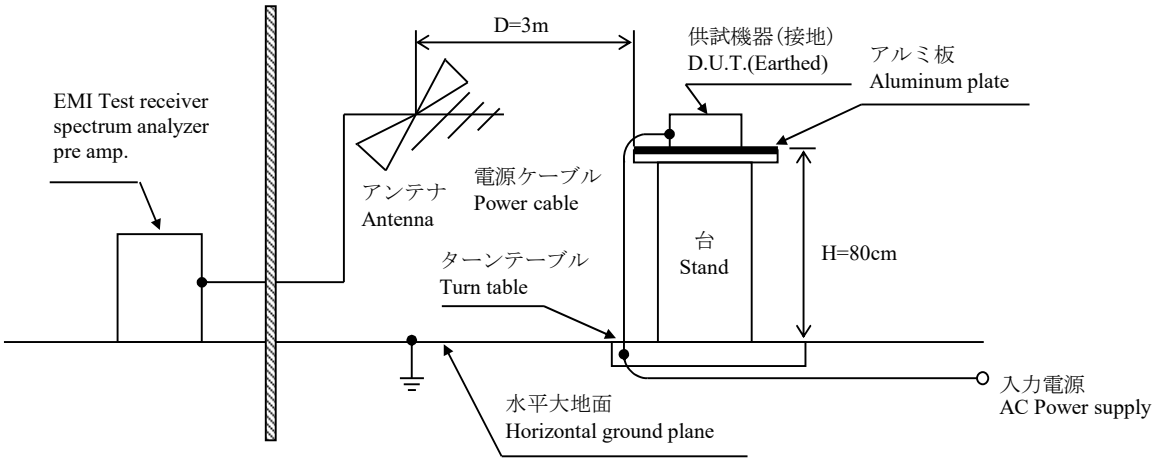
測定構成　Configuration used for determination

• EMI特性　Electro-Magnetic Interference characteristics

(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 / DLM1740
2	DIGITAL MULTIMETER	AGILENT	34970A
3	DIGITAL POWER METER	YOKOGAWA ELECT.	WT210
4	CURRENT PROBE	YOKOGAWA ELECT.	701928
5	DYNAMIC DUMMY LOAD	TAKASAGO	FK-400L
6	DYNAMIC DUMMY LOAD	KIKUSUI	PLZ1004W
7	DUMMY LOAD	PCN	PHF250 SERIES
8	ISOLATION TRANS	NOISE KEN	TF-2302P
9	CVCF	TAKASAGO	AA2000XG/AA2000XG2
10	CVCF	NF	ES10000S
11	LEAKAGE CURRENT METER	HIOKI	3156
12	DYNAMIC DIP SIMULATOR	TAKAMISAWA	PSA-210
13	CONTROLLED TEMP. CHAMBER	ESPEC	SU-240
14	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESCI
15	PRE AMP.	SONOMA	310N
16	AMN	SCHWARZBECK	NNLK8121
17	ANTENNA	SCHWARZBECK	CBL6111D
18	HARMONIC / FLICKER ANALYZER	KIKUSUI	KHA1000
19	SINGLE-PHASE MASTER	NF	4420
20	REFERENCE IMPEDANCE NETWORK 20A	NF	4150
21	MULTI OUTLET UNIT	KIKUSUI	OT01-KHA

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。
出力ディレーティングについての詳細は、仕様書の「LOAD vs INPUT VOLTAGE」を
ご参照ください。
Output derating is required for AC input voltage less than 90VAC.
For more information about Output derating, please refer to “LOAD vs INPUT VOLTAGE”
of specifications.

Vin	Iout : 100%
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

24V

1. Regulation - line and load　　Condition　Ta ： 25 ℃

Iout \ Vin	90VAC	100VAC	200VAC	265VAC	line regulation	
0%	24.006V	24.006V	24.006V	24.006V	0mV	0.000%
50%	24.005V	24.006V	24.005V	24.006V	1mV	0.006%
100%	24.006V	24.006V	24.005V	24.005V	1mV	0.006%
load	1mV	0mV	1mV	1mV		
regulation	0.006%	0.000%	0.006%	0.006%		

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

Ta	-10℃	+25℃	+50℃	temperature stability	
Vout	23.998V	24.006V	23.988V	18mV	0.100%

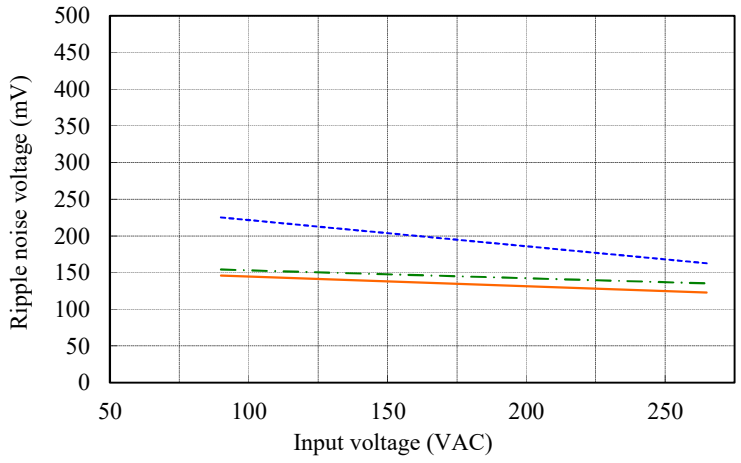
3. Start up voltage and Drop out voltage　　Conditions　Ta ： 25 ℃
Iout ： 100 %

Start up voltage (Vin)	78VAC
Drop out voltage (Vin)	48VAC

(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℃
25℃
50℃

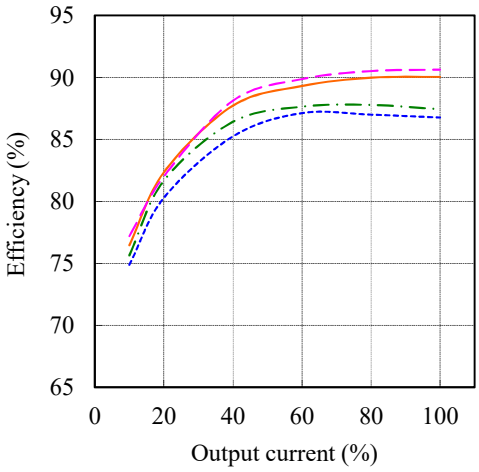
24V

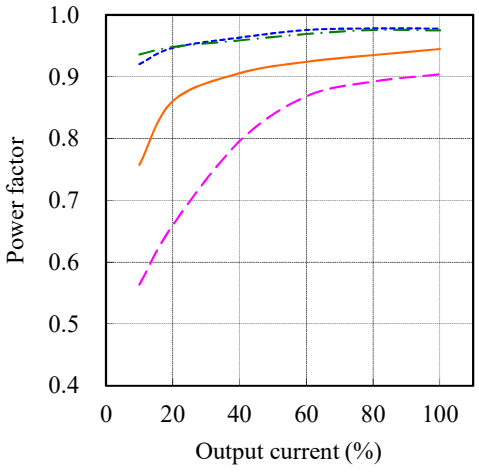


(3) 効率・力率対出力電流　Efficiency and Power factor vs. Output current

Conditions　Vin :　90VAC
100VAC
200VAC
265VAC
Ta　:　25℃

24V



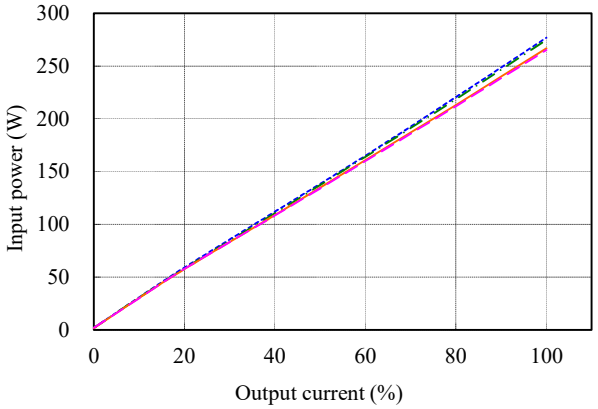


(4)　入力電力対出力電流　Input power　vs. Output current

Conditions　Vin :　90VAC
100VAC
200VAC
265VAC
Ta　:　25℃

24V

Vin	Input power	
	Iout : 0%	Control OFF*
90VAC	1.9W	1.6W
100VAC	2.0W	1.7W
200VAC	2.0W	1.7W
265VAC	2.0W	1.8W



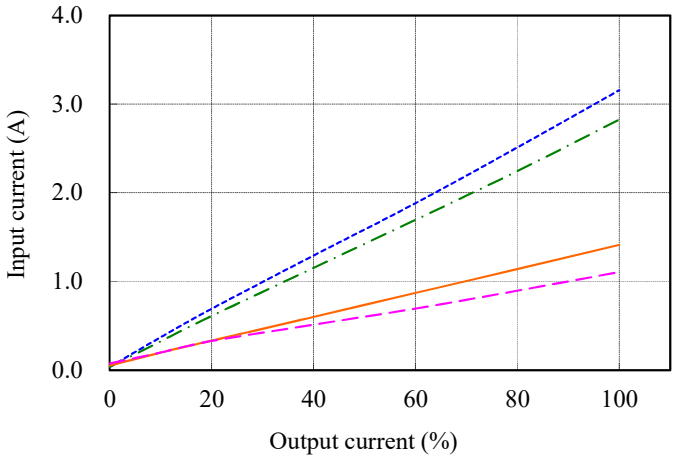
準標準品 ZWS240RC-/R にて対応
For option model ZWS240RC-*/R

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

Conditions　Vin : 90VAC
100VAC
200VAC
265VAC
Ta : 25℃

24V

Vin	Input current	
	Iout : 0%	Control OFF*
90VAC	0.04A	0.04A
100VAC	0.04A	0.04A
200VAC	0.06A	0.05A
265VAC	0.08A	0.07A

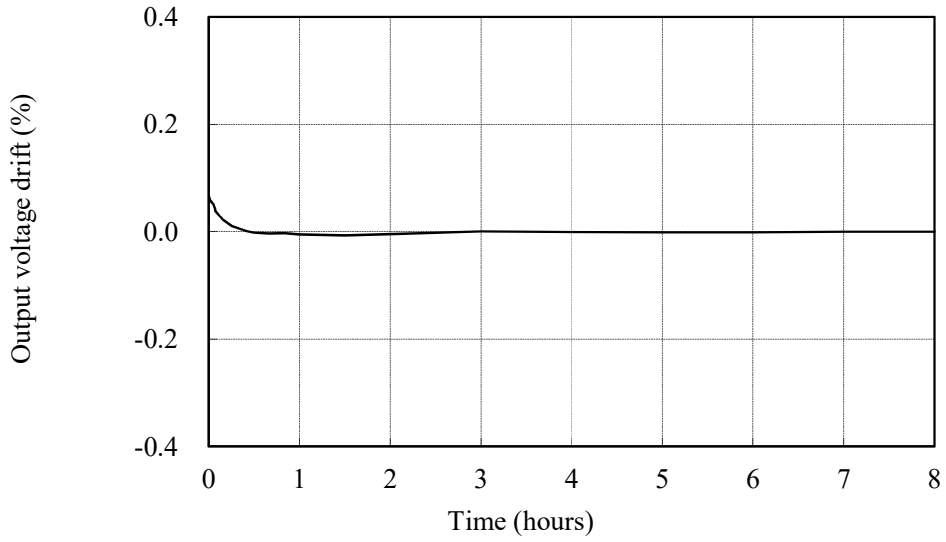


準標準品 ZWS240RC-/R にて対応
For option model ZWS240RC-*/R

2-2. 通電ドリフト特性 Warm up voltage drift characteristics

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

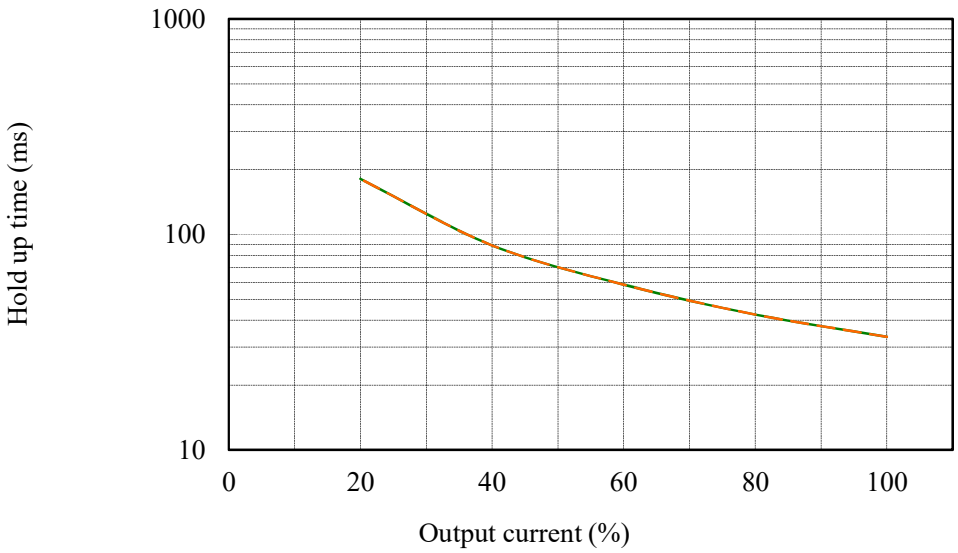
24V



2-3. 出力保持時間特性 Hold up time characteristics

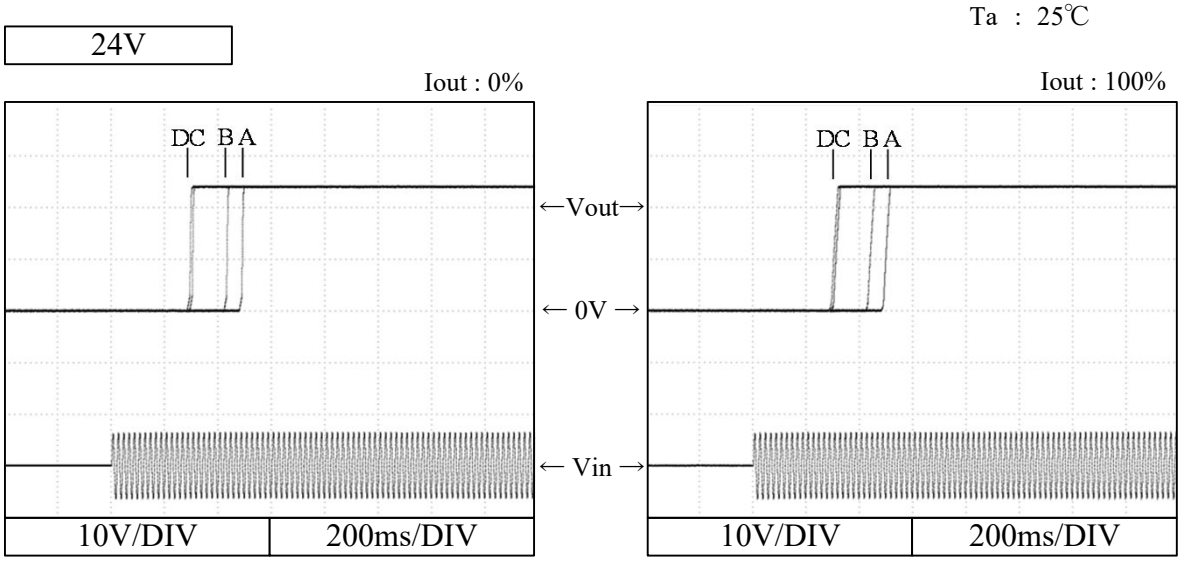
Conditions Vin : 100VAC
200VAC
Ta : 25℃

24V



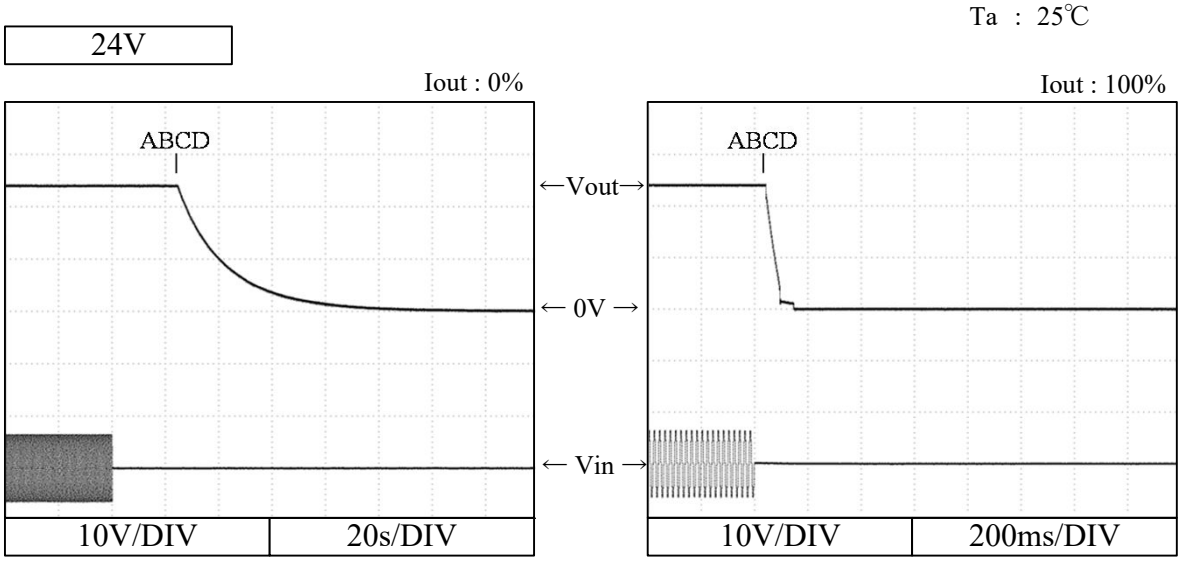
2-4. 出力立ち上がり特性 Output rise characteristics

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



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

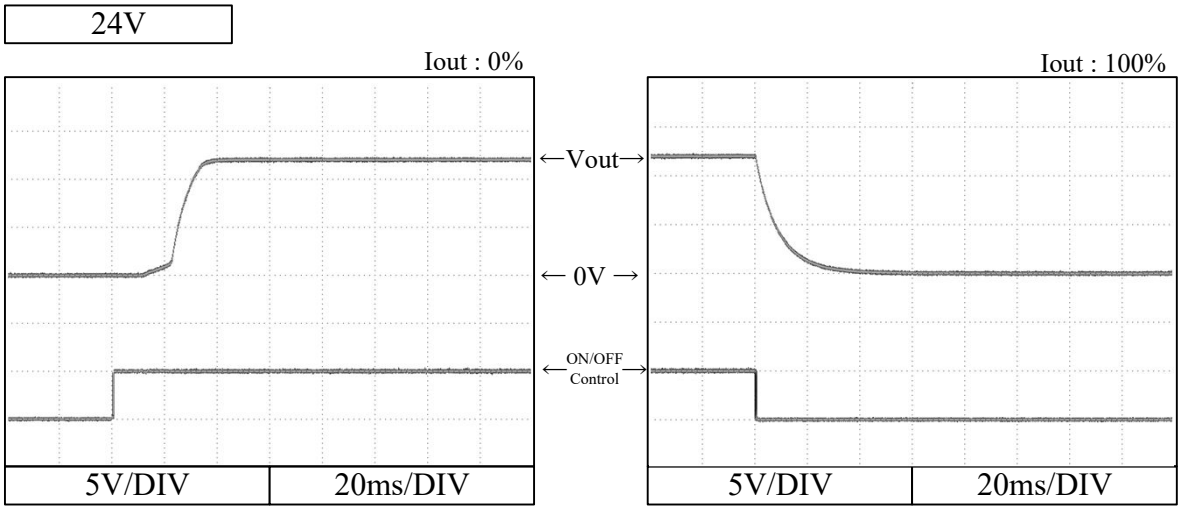
Conditions Vin : 90VAC (A)
: 100VAC (B)
: 200VAC (C)
: 265VAC (D)
Ta : 25℃



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

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

準標準品 ZWS240RC-*/R にて対応
For alternative standard model ZWS240RC-*/R

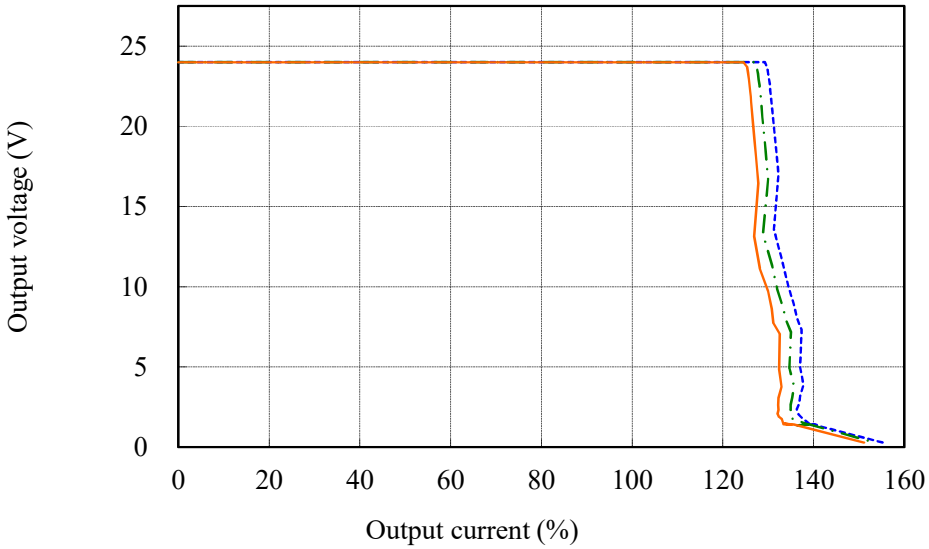


2-7. 過電流保護特性

Over current protection (OCP) characteristics

Conditions Vin : 100VAC
Ta : -10℃
25℃
50℃

24V

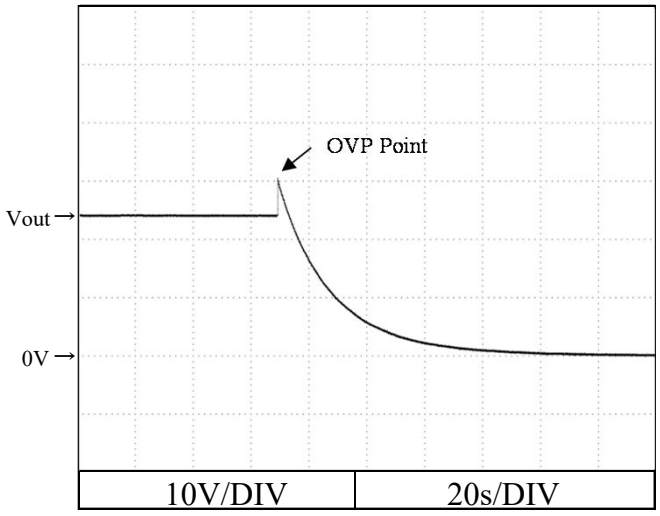


2-8. 過電圧保護特性

Over voltage protection (OVP) characteristics

Conditions Vin : 100VAC
Iout : 0%
Ta : 25℃

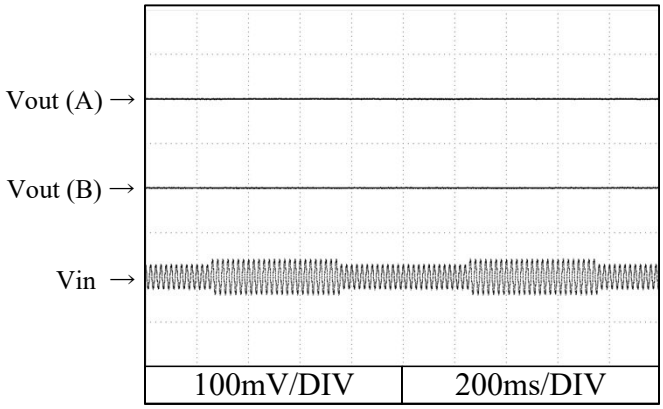
24V



2-9. 過渡応答(入力急変)特性 Dynamic line response characteristics

Conditions Vin : 90VAC←→132VAC (A)
170VAC←→265VAC (B)
Iout : 100%
Ta : 25℃

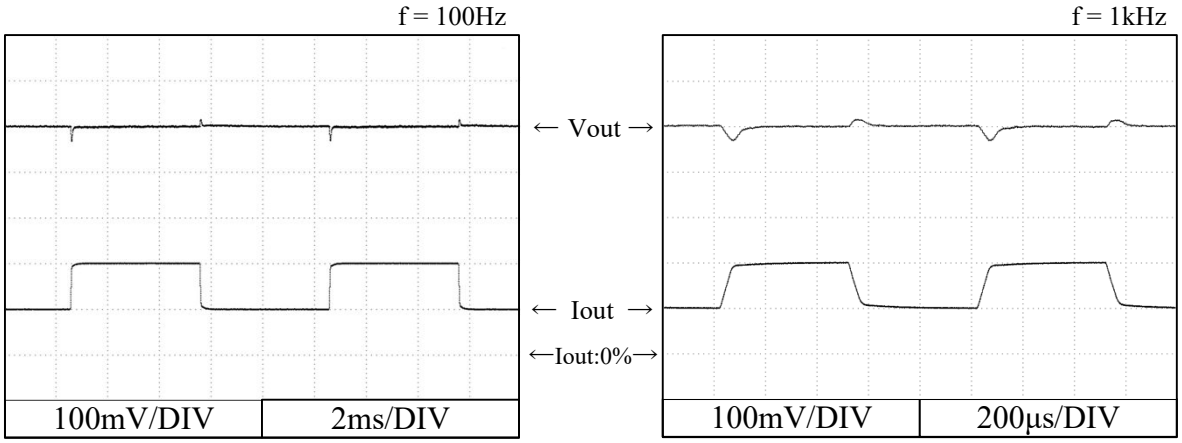
24V



2-10. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions Vin : 100VAC
Iout : 50%←→100%
(tr = tf = 50us)
Ta : 25℃

24V



2-11.　入力電圧瞬停特性　Response to brown out characteristics

Conditions　Iout : 100%
Ta : 25℃

瞬停時間　Interruption time

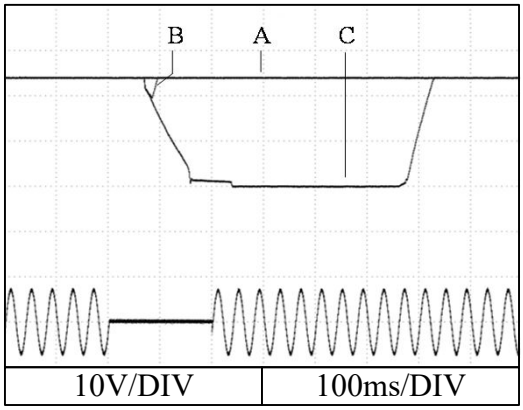
A : 出力電圧が低下なし　Output voltage does not drop.

B : 出力電圧低下が0Vまでいかない　Output voltage drop down not reaching 0V.

C : 出力電圧が0Vまで低下　Output voltage drops until 0V.

24V

Vin : 100VAC
A = 31ms, B = 38ms, C = 98ms

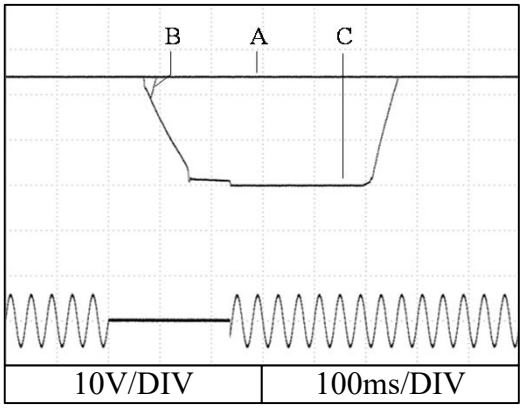


← Vout →

← 0V →

← Vin →

Vin : 200VAC
A = 32ms, B = 40ms, C = 118ms

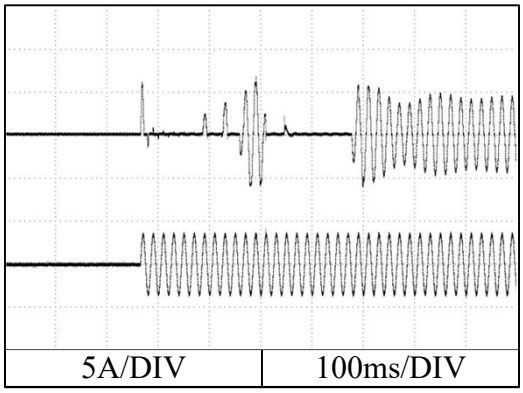


2-12. 入力サージ電流(突入電流)波形 Inrush current waveform

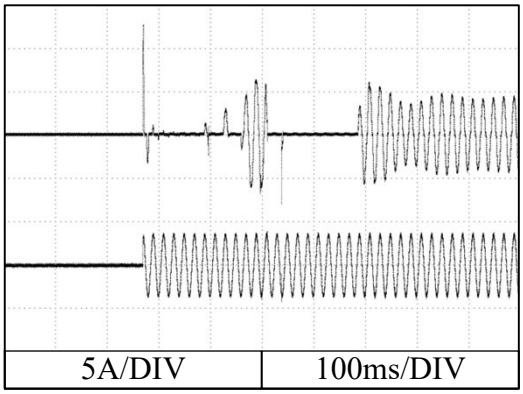
24V

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

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

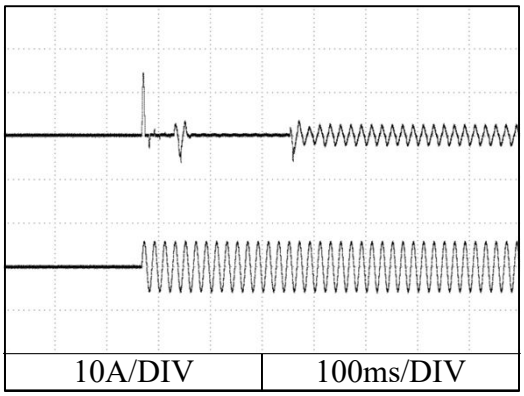


Switch on phase angle of input AC voltage
ϕ = 90°

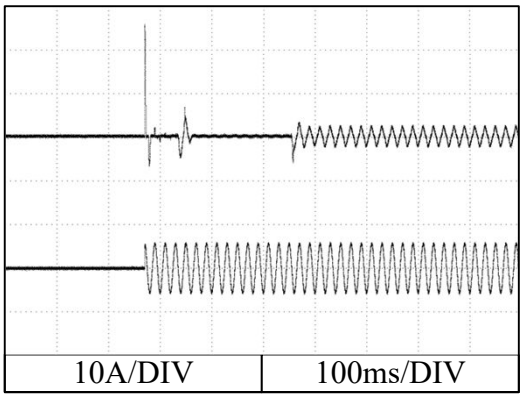


Conditions Vin : 200VAC
Iout : 100%
Ta : 25℃

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



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

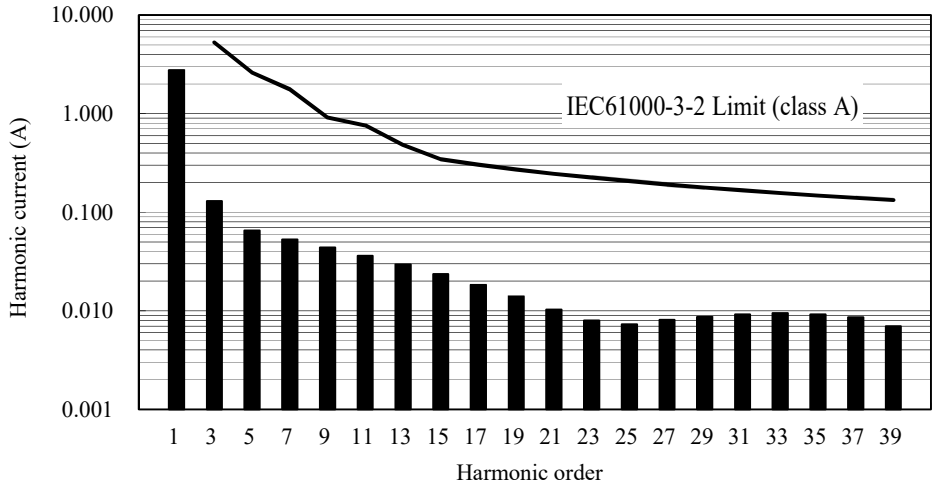


2-13. 高調波成分 Input current harmonics

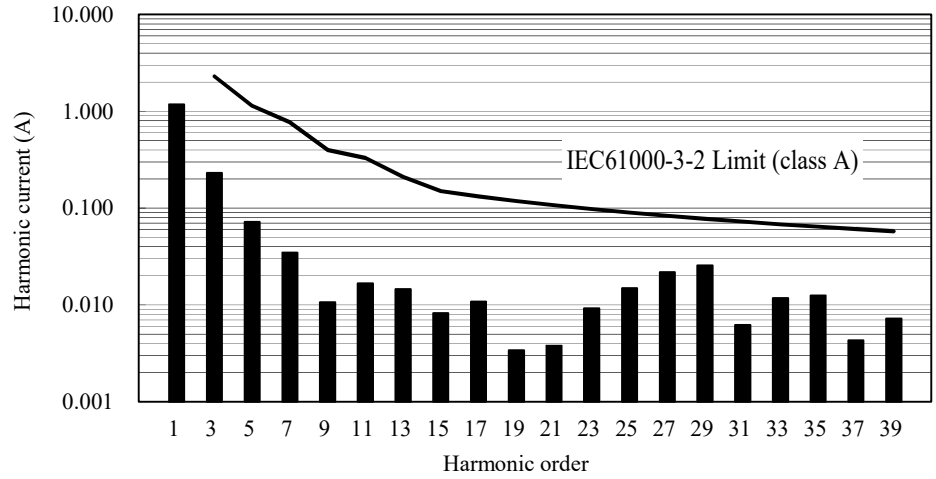
Conditions Iout : 100%
Ta : 25℃

24V

Vin : 100VAC



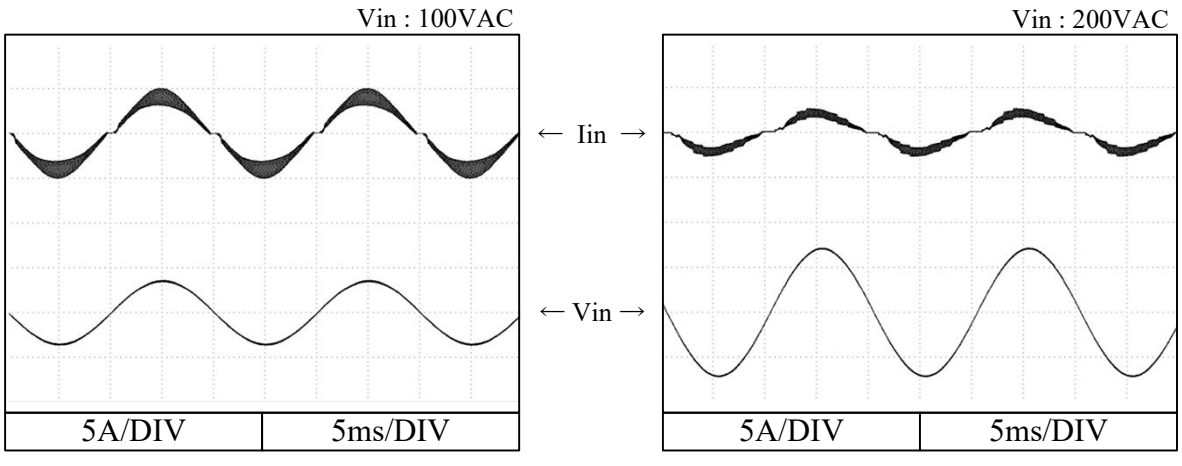
Vin : 230VAC



2-14. 入力電流波形 Input current waveform

Conditions Iout : 100%
Ta : 25℃

24V

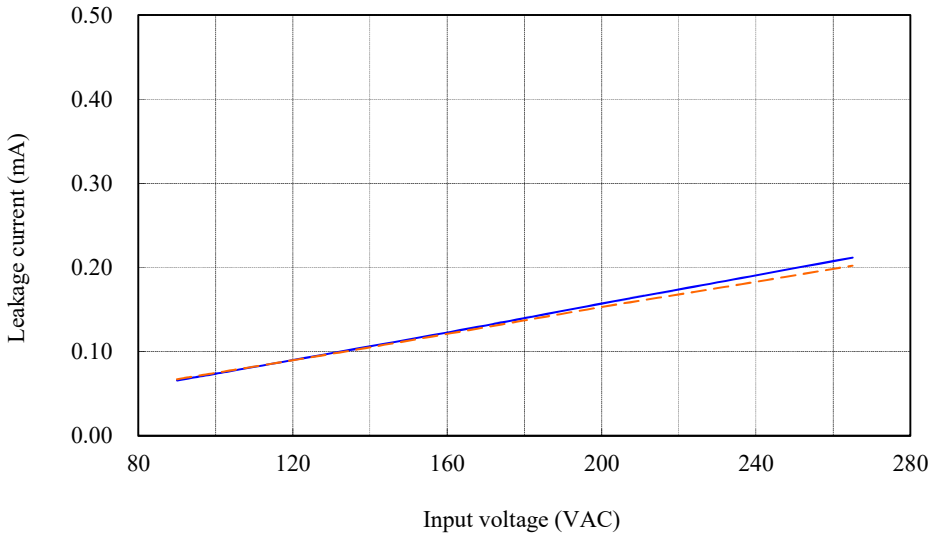


2-15. リーク電流特性 Leakage current characteristics

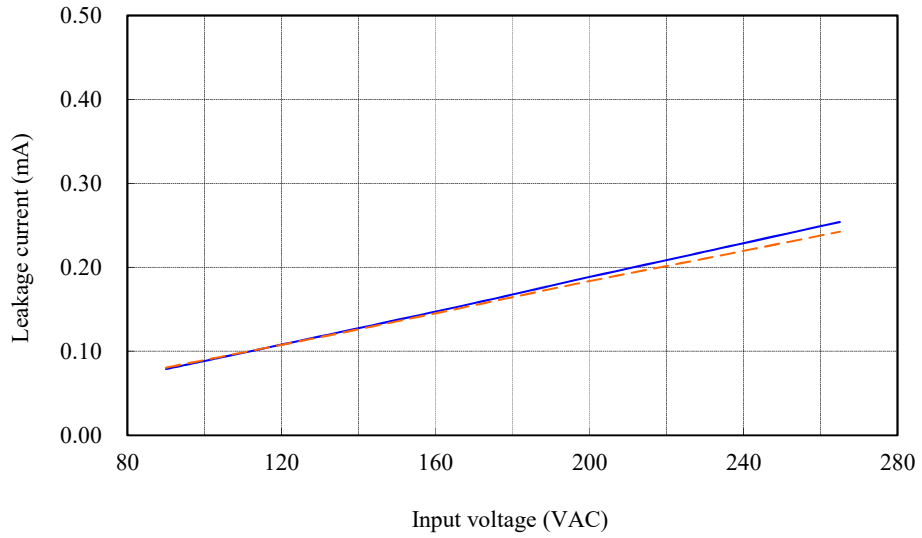
Conditions Iout : 0%
100%
Ta : 25℃
Equipment used : 3156 (HIOKI)

24V

f : 50Hz



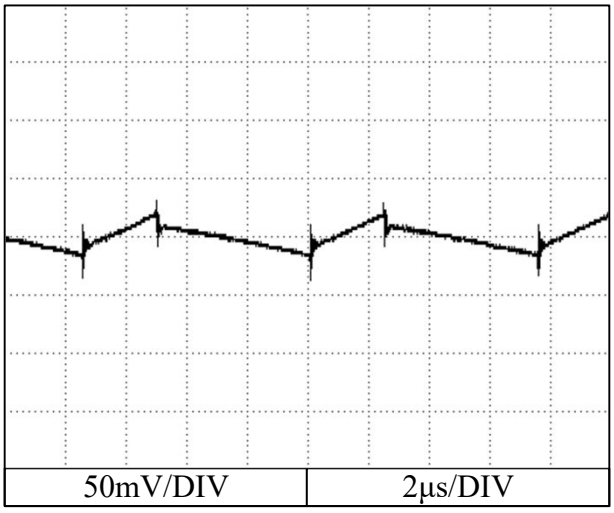
f : 60Hz



2-16. 出力リップル、ノイズ波形 Output ripple and noise waveform

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

24V



2-17.　EMI特性　Electro-Magnetic Interference characteristics

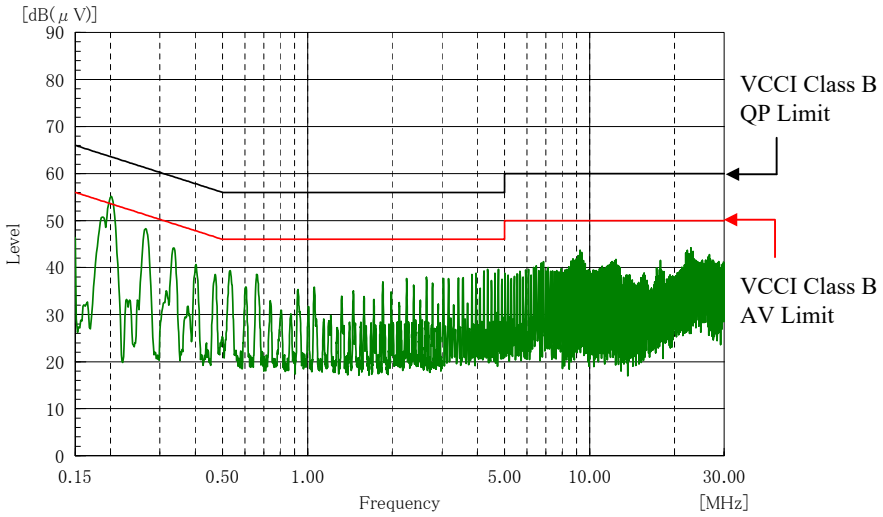
Conditions　Vin ：230VAC
Iout ：100%
Ta　：25℃

雑音端子電圧　Conducted Emission

24V

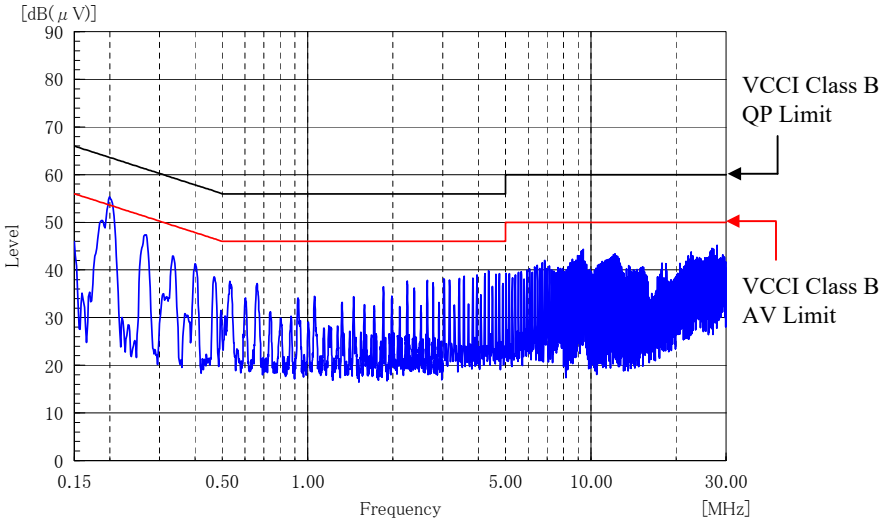
Phase： N

Ref. Data	Point A (202kHz) Limit (dB)	Measure (dB)
QP	63.5	53.4
AV	53.5	48.5



Phase： L

Ref. Data	Point B (200kHz) Limit (dB)	Measure (dB)
QP	63.6	53.1
AV	53.6	48.2



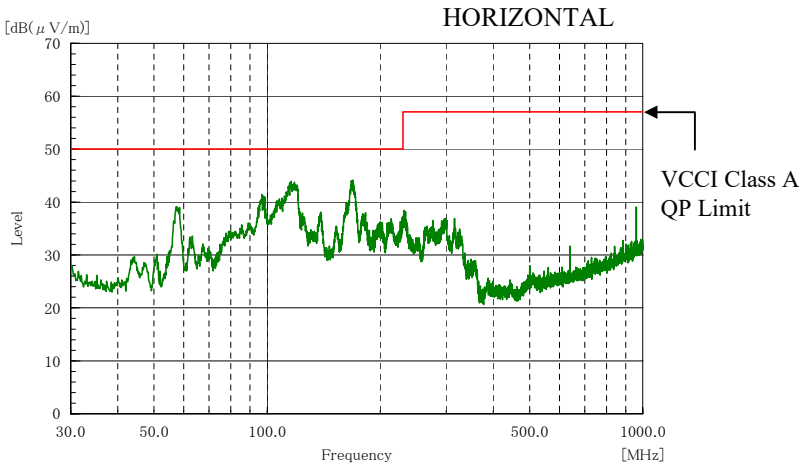
EN55011-B,EN55032-B,FCC-Bの限界値はVCCI class Bの限界値と同じ
Limit of EN55011-B,EN55032-B,FCC-B are same as its VCCI class B.

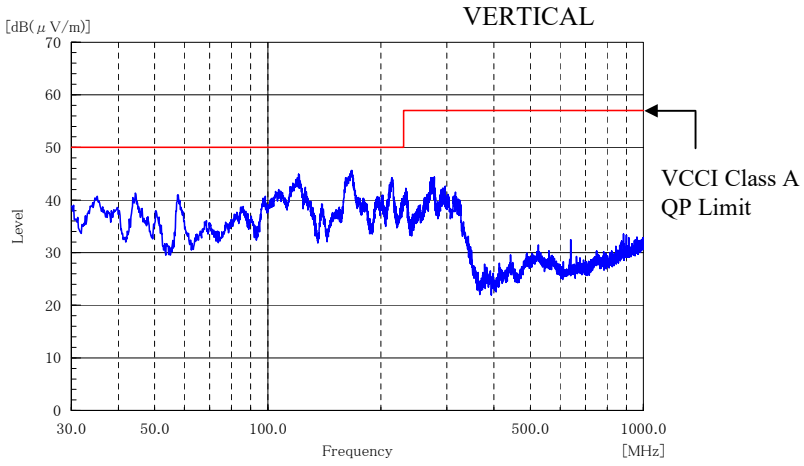
2-17.　EMI特性　Electro-Magnetic Interference characteristics

Conditions　Vin：230VAC
Iout：100%
Ta　：25℃

雑音電界強度　Radiated Emission

24V





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

表示はピーク値
Indication is peak values.