

CME150A

EVALUATION DATA

型式データ

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2. 特性データ Characteristics

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使用記号 Terminology used

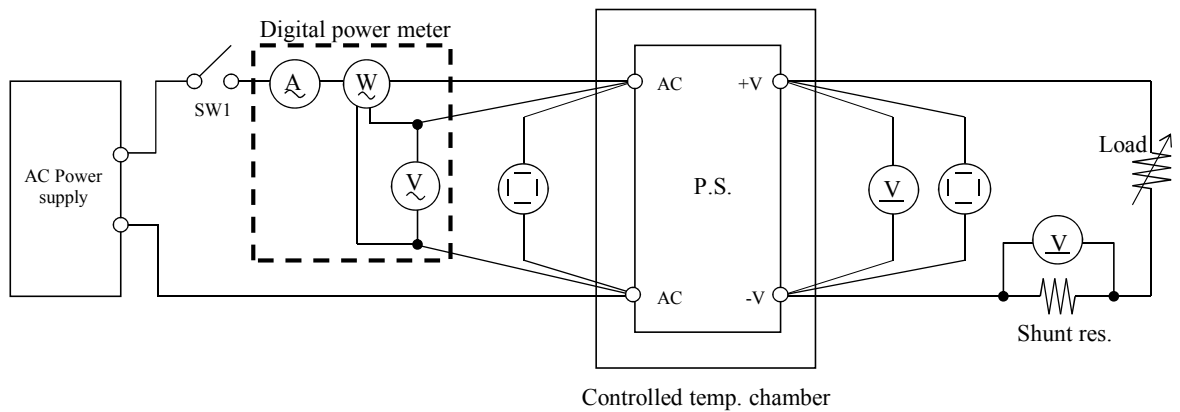
	定義	Definition
V_{in}	入力電圧 Input voltage
V_{out}	出力電圧 Output voltage
I_{in}	入力電流 Input current
I_{out}	出力電流 Output current
T_a	周囲温度 Ambient temperature
f	周波数 Frequency

1. 測定方法 Evaluation Method

1.1 測定回路 Circuit used for determination

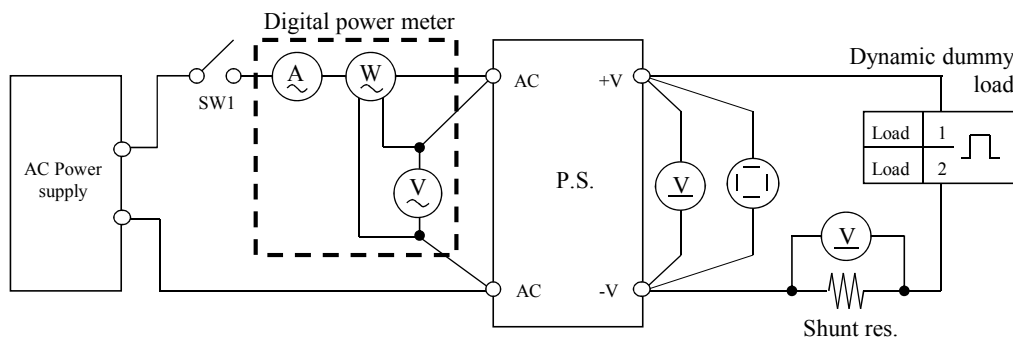
測定回路1 Circuit 1 used for determination

- ・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

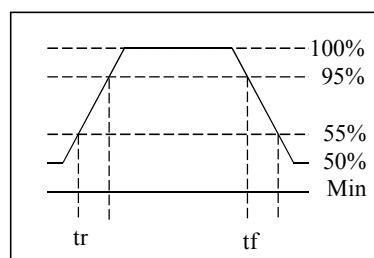


測定回路2 Circuit 2 used for determination

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

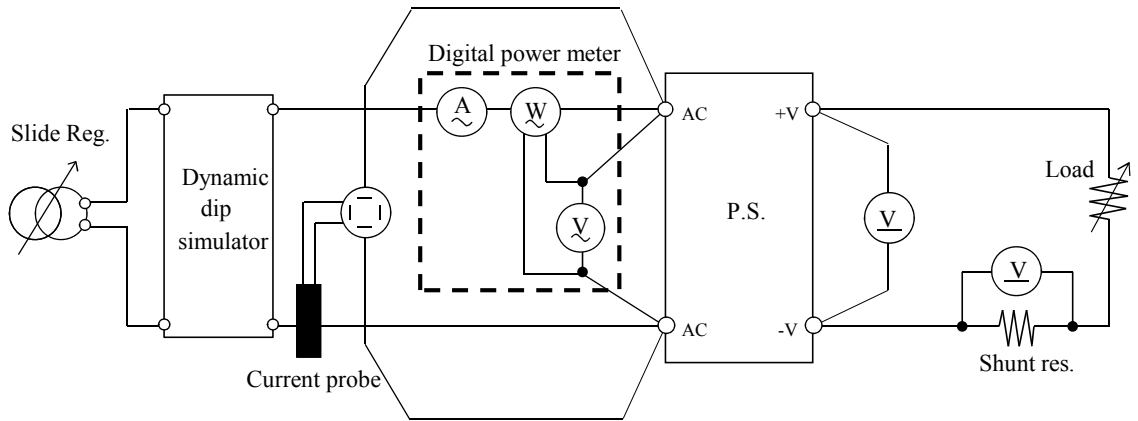


Output current waveform
Iout 50% <=> 100%



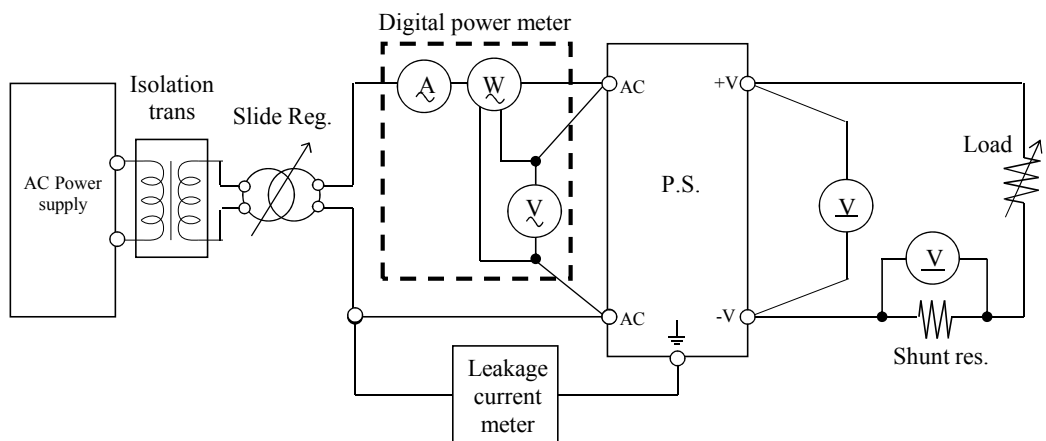
測定回路3 Circuit 3 used for determination

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



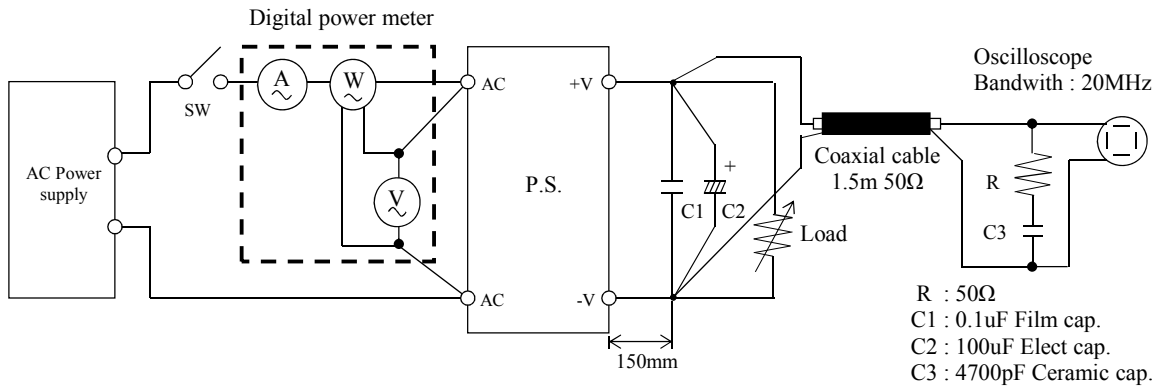
測定回路4 Circuit 4 used for determination

・リーク電流特性 Leakage current characteristics



測定回路5 Circuit 5 used for determination

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

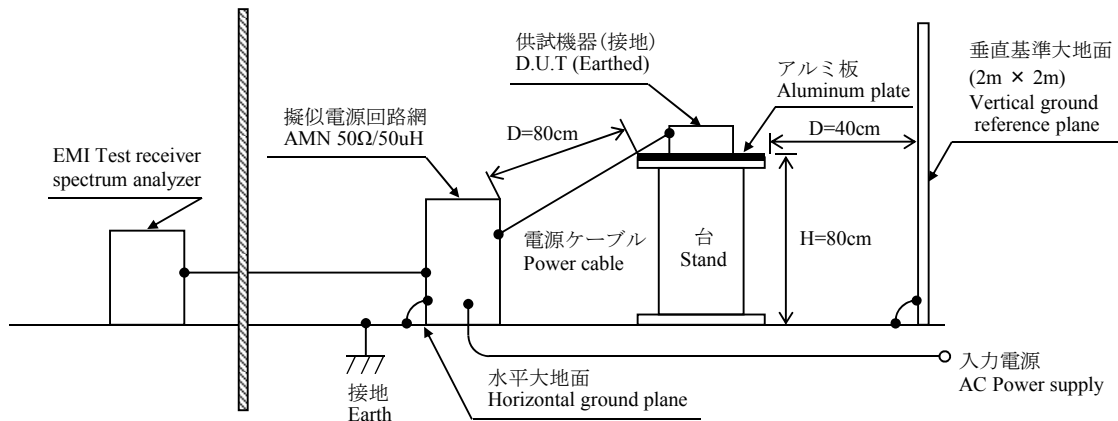


測定構成 Configuration used for determination

・EMI特性 Electro-Magnetic Interference characteristics

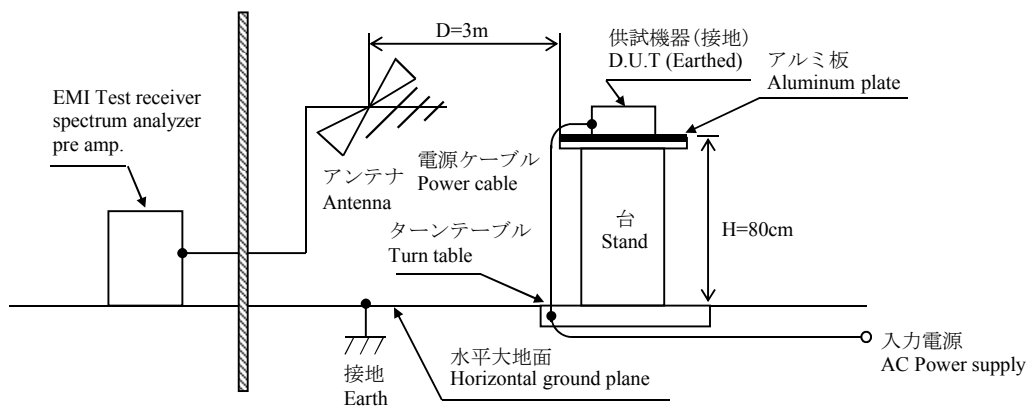
(a) 雑音端子電圧 (帰還ノイズ)

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.	DLM2054
2	DIGITAL MULTIMETER	AGILENT	34970A
3	DIGITAL POWER METER	YOKOGAWA ELECT.	WT210
4	CURRENT PROBE	YOKOGAWA ELECT.	701932
5	DYNAMIC DUMMY LOAD	CHROMA	63201
6	CVCF	KIKUSUI	PCR2000LE
7	LEAKAGE CURRENT METER	SIMPSON	228
8	CONTROLLED TEMP. CHAMBER	TABAI-ESPEC	SU-661
9	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESCI-03
10	AMN	ROHDE & SCHWARZ	ENV216
11	ANTENNA	EMCO	63208

1.3 評価負荷条件 Load conditions

*入力電圧が115VAC以下の場合、下記のとおり出力デレーティングが必要です。

Output derating is needed when input voltage is less than 115VAC.

V _{in}	I _{out} : Full load	12V	18V	24V	36V	48V
85VAC	80%	10.00A	6.72A	5.04A	3.36A	2.56A
115 - 265VAC	100%	12.5A	8.4A	6.3A	4.2A	3.2A

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

12V

1. Regulation - line and load

Condition Ta : 25 °C

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	line regulation	
0%	12.015V	12.015V	12.015V	12.016V	1mV	0.008%
50%	12.013V	12.013V	12.013V	12.013V	0mV	0.000%
100%	-	12.013V	12.012V	12.012V	1mV※1	0.008%
Load regulation	2mV	2mV	3mV	4mV		
	0.017%	0.017%	0.025%	0.033%		

2. Temperature drift

Conditions Vin : 115 VAC

Iout : Full load

Ta	-20°C	+25°C	+50°C	temperature stability	
Vout	11.978V	12.013V	12.001V	35mV	0.292%

3. Start up voltage and Drop out voltage

Conditions Ta : 25 °C

Iout : 100%

Start up voltage (Vin)	78VAC
Drop out voltage (Vin)	76VAC

24V

1. Regulation - line and load

Condition Ta : 25 °C

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	line regulation	
0%	24.003V	24.003V	24.003V	24.002V	1mV	0.004%
50%	23.998V	23.998V	23.998V	23.998V	0mV	0.000%
100%	-	23.996V	23.997V	23.997V	1mV※1	0.004%
Load regulation	5mV	7mV	6mV	5mV		
	0.021%	0.029%	0.025%	0.021%		

2. Temperature drift

Conditions Vin : 115 VAC

Iout : Full load

Ta	-20°C	+25°C	+50°C	temperature stability	
Vout	23.920V	23.996V	23.983V	76mV	0.317%

3. Start up voltage and Drop out voltage

Conditions Ta : 25 °C

Iout : 100%

Start up voltage (Vin)	78VAC
Drop out voltage (Vin)	76VAC

48V

1. Regulation - line and load

Condition Ta : 25 °C

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	line regulation	
0%	48.040V	48.035V	48.039V	48.034V	6mV	0.013%
50%	48.013V	48.013V	48.014V	48.014V	1mV	0.002%
100%	-	48.011V	48.011V	48.012V	1mV※1	0.002%
Load regulation	27mV	24mV	28mV	22mV		
	0.056%	0.050%	0.058%	0.046%		

2. Temperature drift

Conditions Vin : 115 VAC

Iout : Full load

Ta	-20°C	+25°C	+50°C	temperature stability	
Vout	47.934V	48.011V	47.919V	92mV	0.192%

3. Start up voltage and Drop out voltage

Conditions Ta : 25 °C

Iout : 100%

Start up voltage (Vin)	78VAC
Drop out voltage (Vin)	76VAC

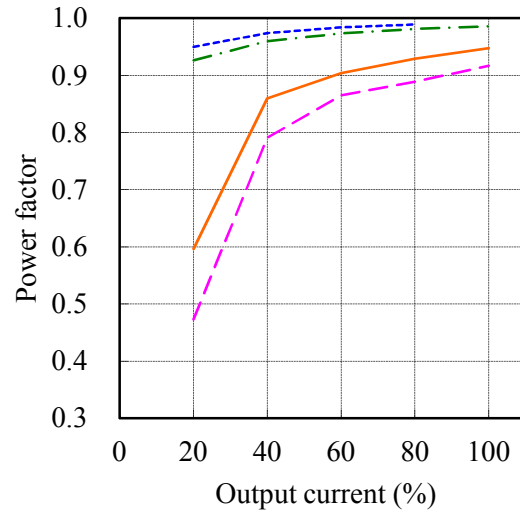
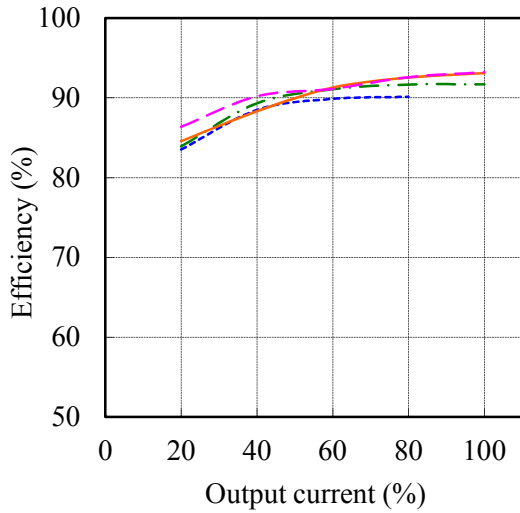
※1 Line regulation : 115VAC - 265VAC

(3) 効率・力率対出力電流

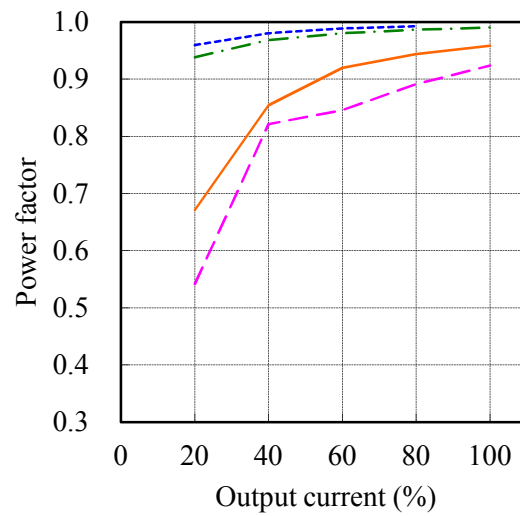
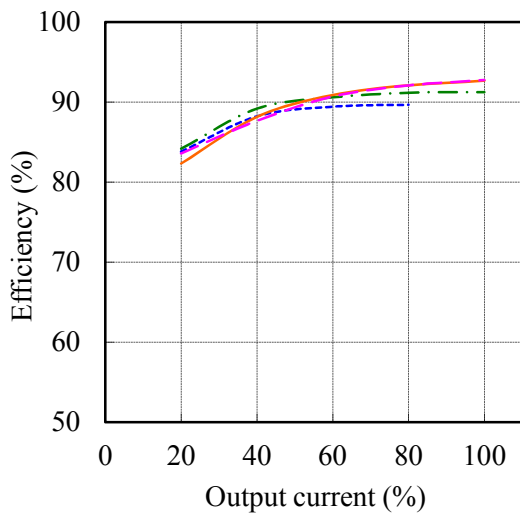
Efficiency and Power factor vs. Output current

Conditions Vin : 85 VAC ---
 115 VAC -.-
 230 VAC —
 265 VAC -.-
 Ta : 25 °C

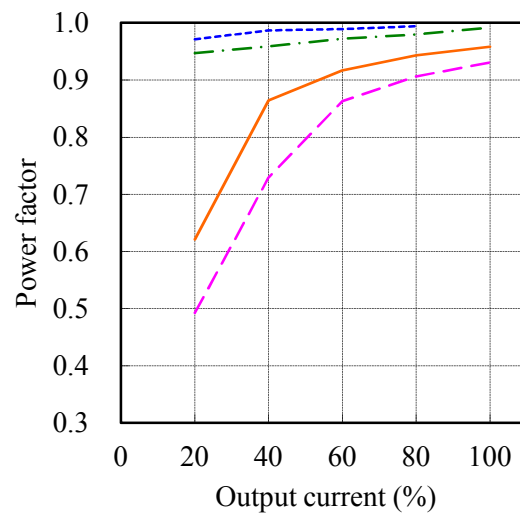
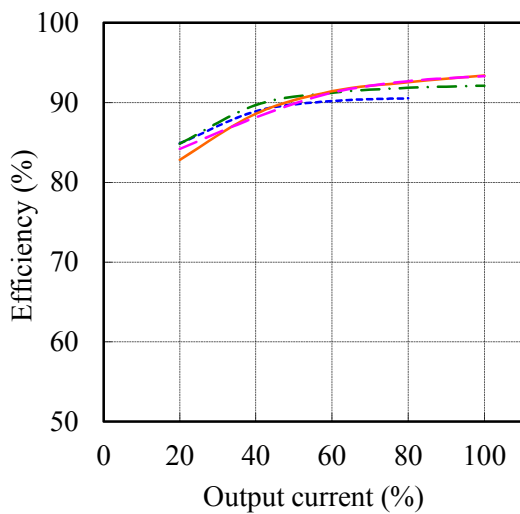
12V



24V



48V



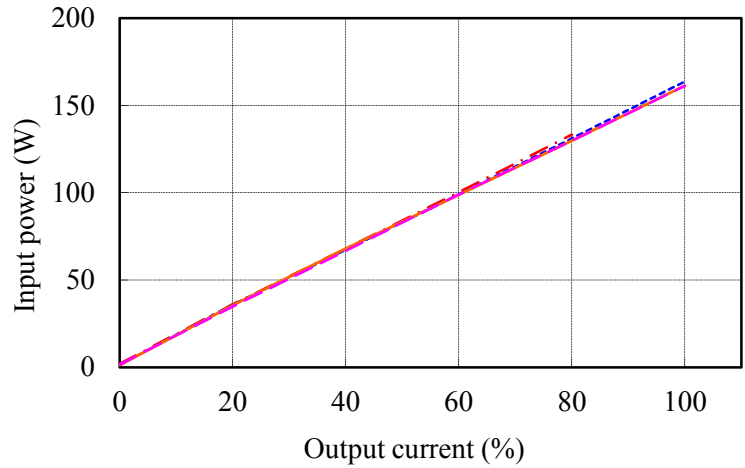
(3) 入力電力対出力電流

Input power vs. Output current

Conditions Vin : 85 VAC ---
 115 VAC ---
 230 VAC ---
 265 VAC ---
 Ta : 25 °C

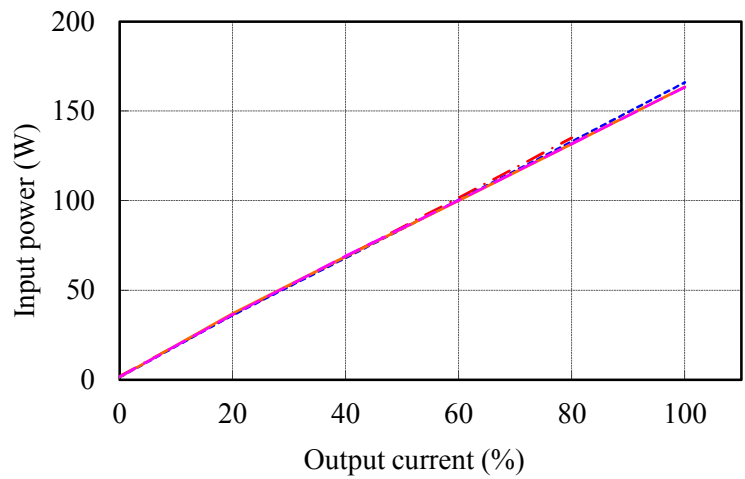
12V

Vin	Input power
	Iout : 0%
85VAC	1.92W
115VAC	1.29W
230VAC	1.30W
265VAC	1.50W



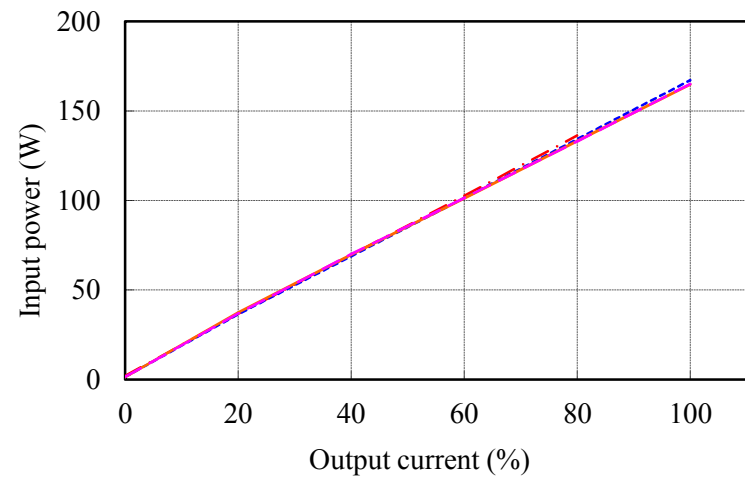
24V

Vin	Input power
	Iout : 0%
85VAC	1.97W
115VAC	1.40W
230VAC	1.30W
265VAC	1.50W



48V

Vin	Input power
	Iout : 0%
85VAC	2.03W
115VAC	1.38W
230VAC	1.30W
265VAC	1.50W



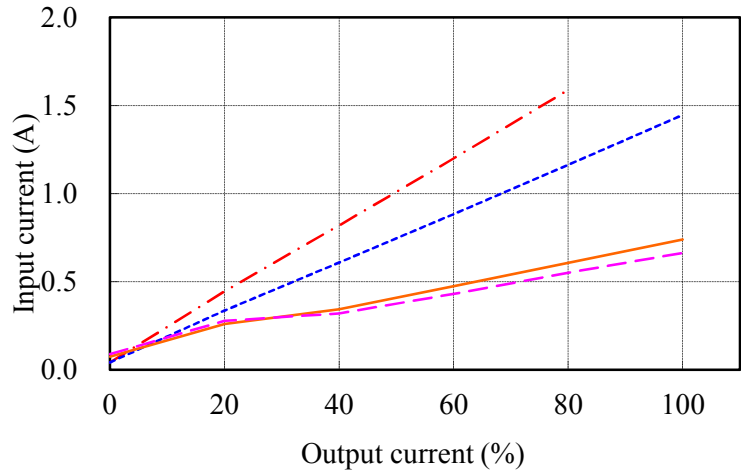
(4) 入力電流対出力電流

Input current vs. Output current

Conditions Vin : 85 VAC ---
 115 VAC - - -
 230 VAC ———
 265 VAC - · - · -
 Ta : 25 °C

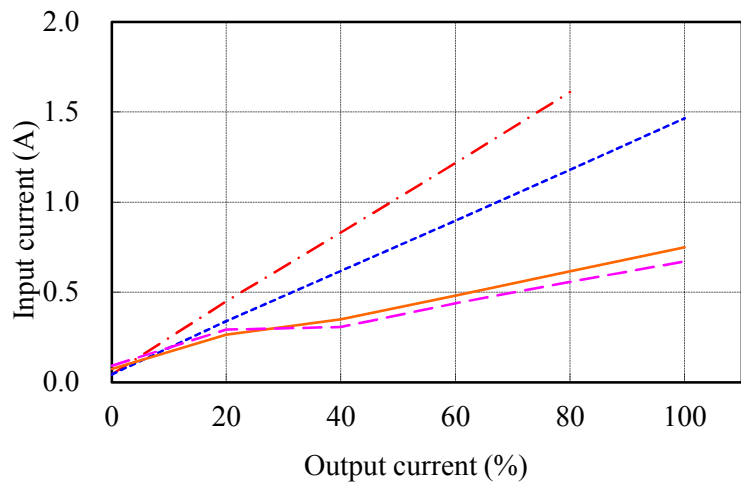
12V

Vin	Input current
	Iout : 0%
85VAC	0.043A
115VAC	0.043A
230VAC	0.075A
265VAC	0.089A



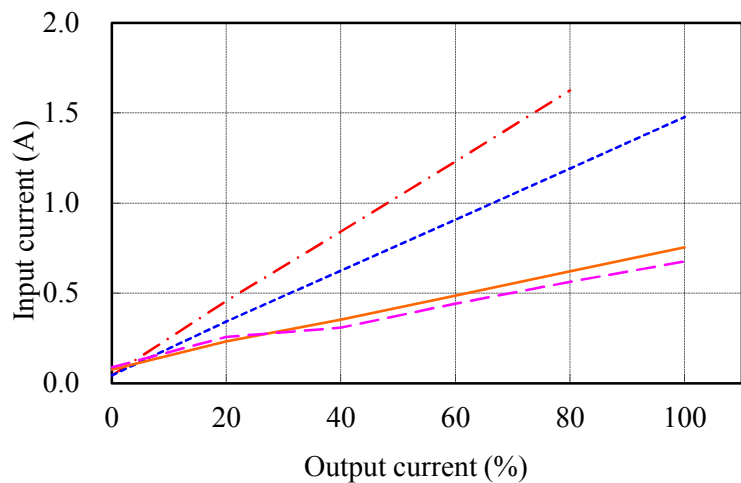
24V

Vin	Input current
	Iout : 0%
85VAC	0.044A
115VAC	0.043A
230VAC	0.074A
265VAC	0.092A



48V

Vin	Input current
	Iout : 0%
85VAC	0.043A
115VAC	0.043A
230VAC	0.075A
265VAC	0.088A

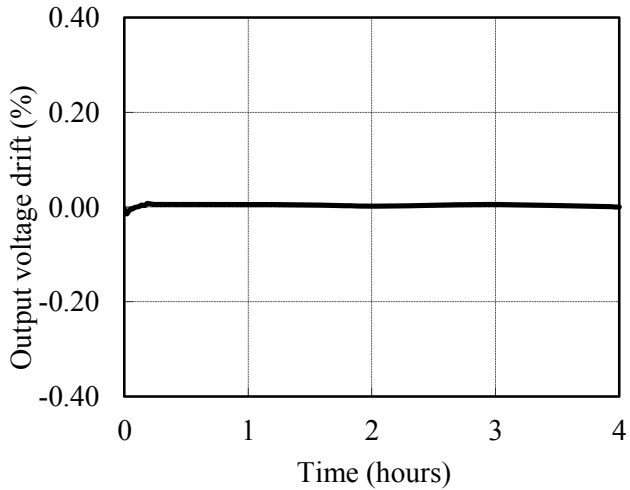


2.2 通電ドリフト特性

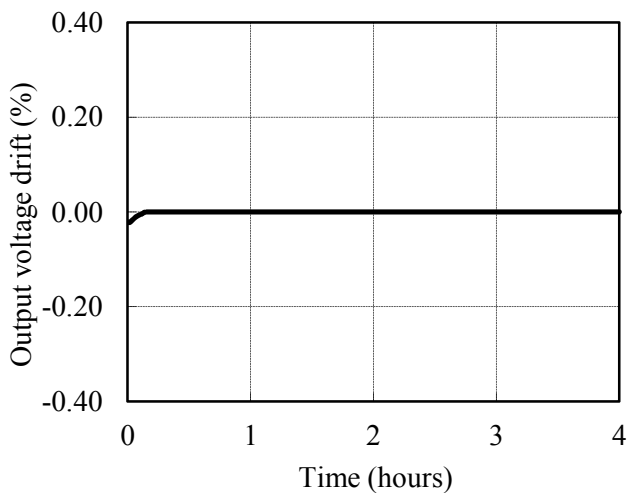
Warm up voltage drift characteristics

Conditions Vin : 115 VAC
Iout : Full load
Ta : 25 °C

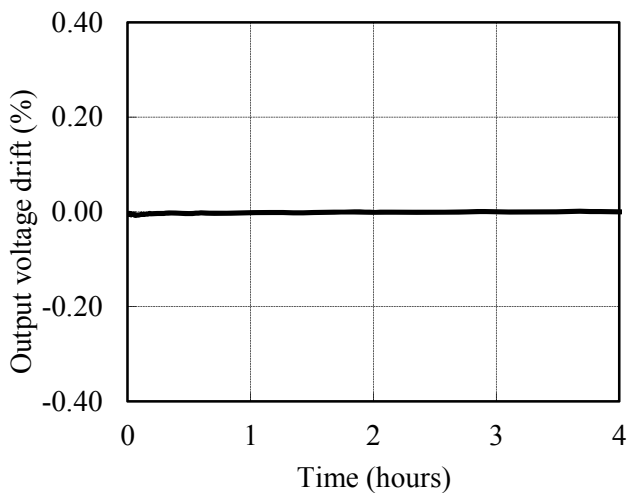
12V



24V



48V

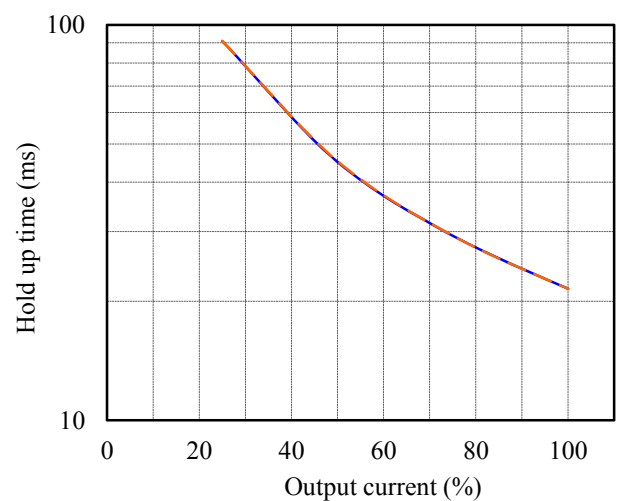
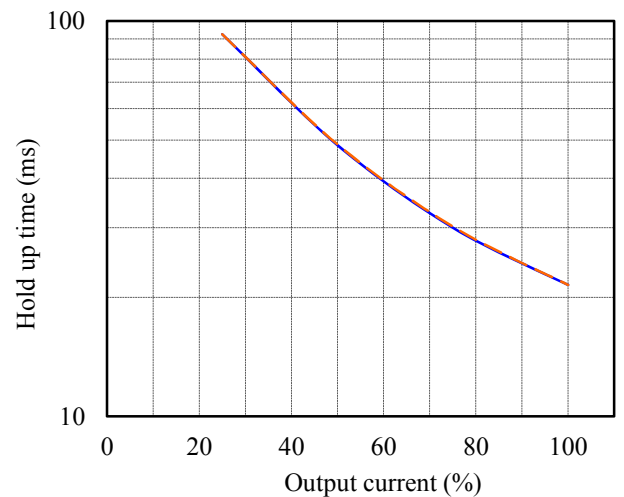
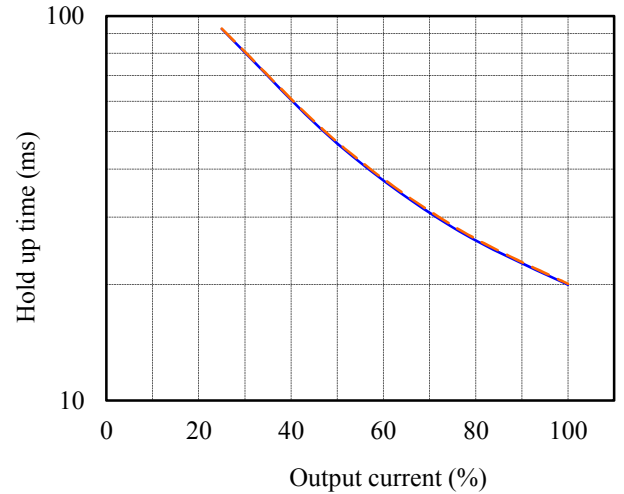


2.3 出力保持時間特性

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Hold up time characteristics

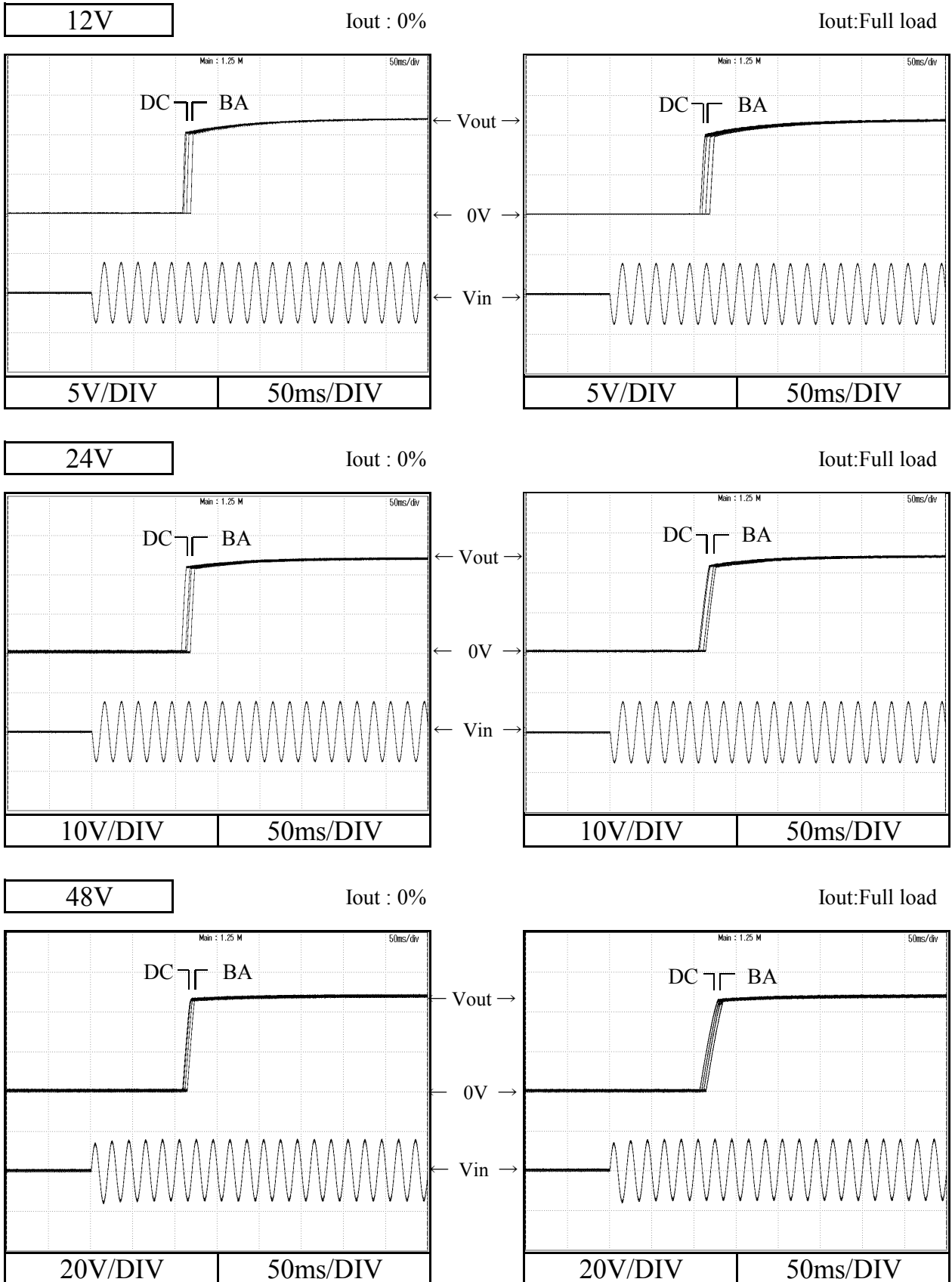
Conditions Vin : 115 VAC ———
230 VAC - - - -
Ta : 25 °C



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

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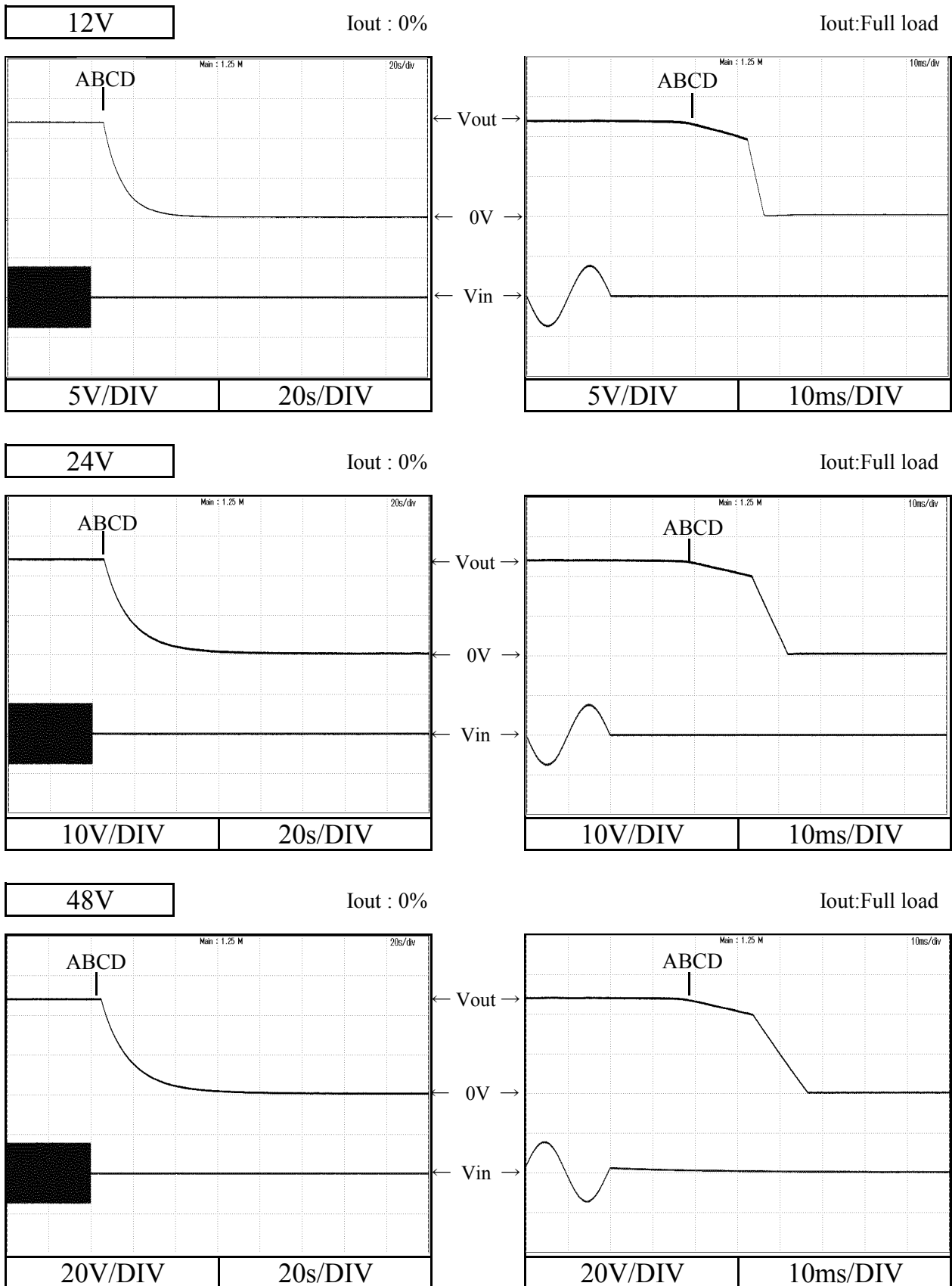
Conditions Vin : 85 VAC (A)
115 VAC (B)
230 VAC (C)
265 VAC (D)
Ta : 25 °C



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

CME150A

Conditions Vin : 85 VAC (A)
115 VAC (B)
230 VAC (C)
265 VAC (D)
Ta : 25 °C



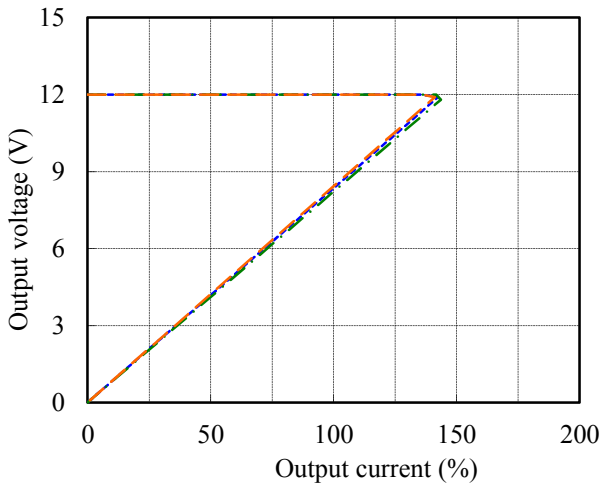
2.6 過電流保護特性

Over current protection (OCP) characteristics

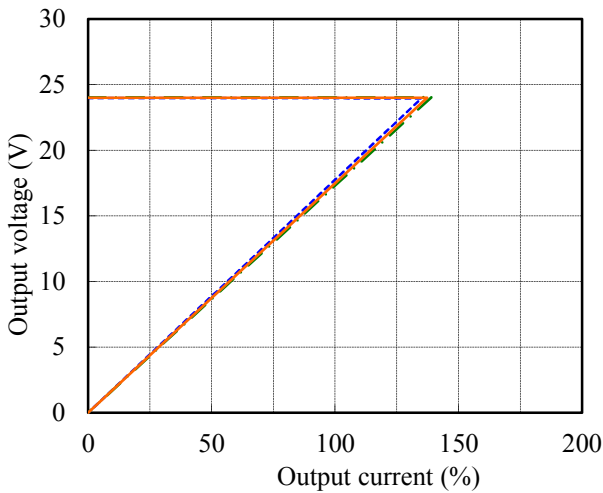
Conditions Vin : 115 VAC

Ta : -20 °C — — — —
 25 °C - · - · -
 50 °C - - - -

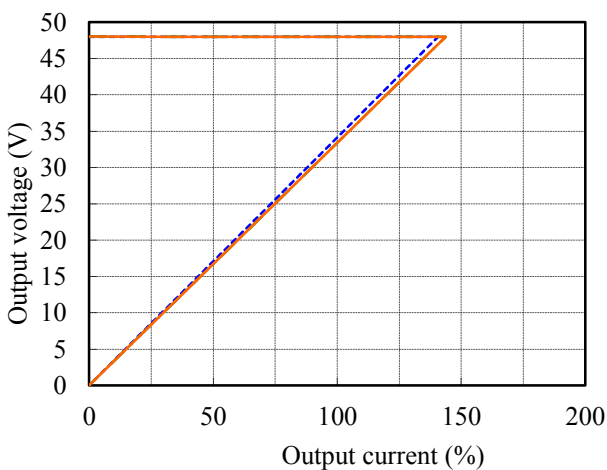
12V



24V



48V

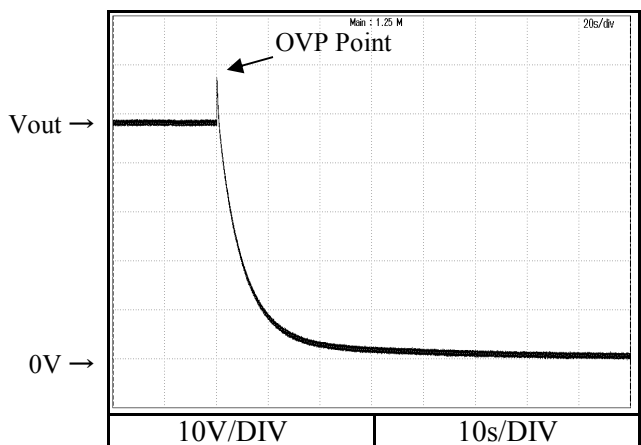
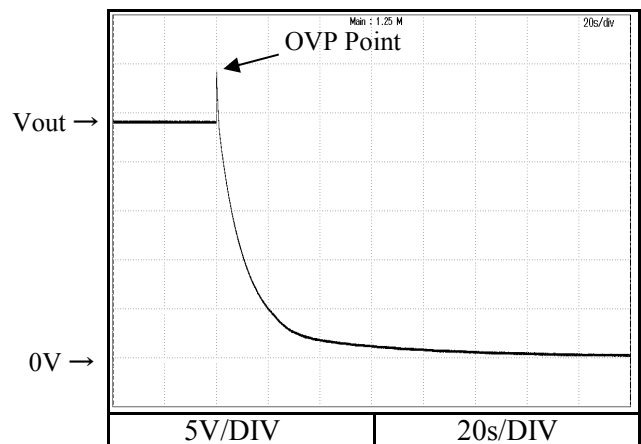
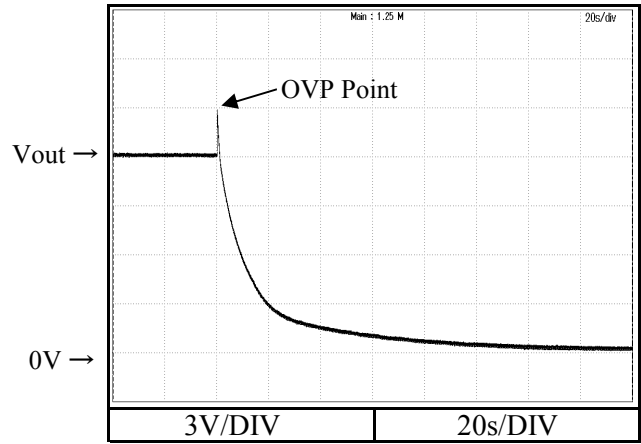


2.7 過電圧保護特性

Over voltage protection (OVP) characteristics

Conditions Vin : 115 VAC

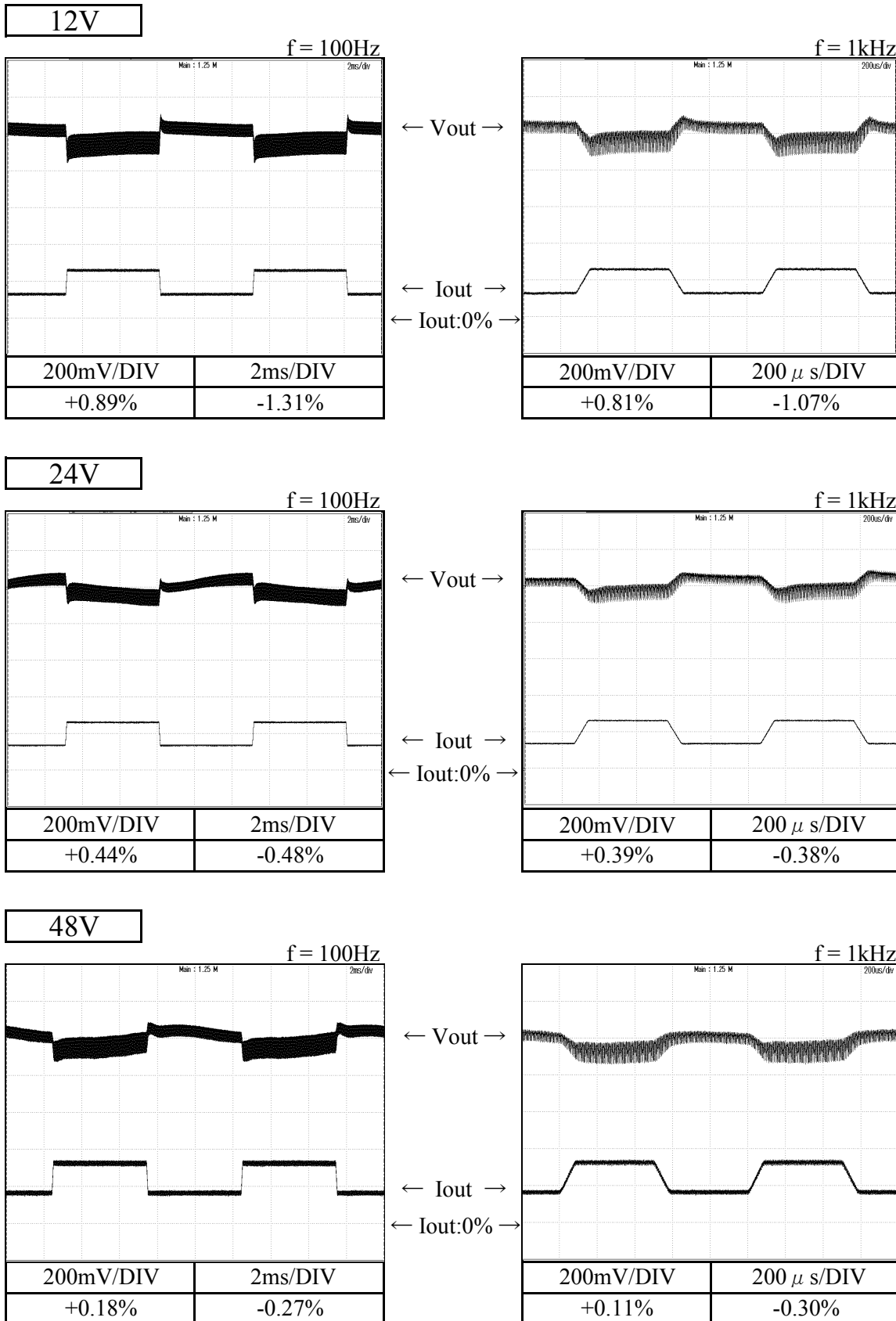
Iout : 0 %
 Ta : 25 °C



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

CME150A

Conditions Vin : 115 VAC
Iout : 50 % ↔ 100 %
(tr = tf = 75us)
Ta : 25 °C



2.9 入力電圧瞬停特性

Response to brown out characteristics

CME150A

Conditions Ta : 25 °C
Iout : Full load

瞬停時間 Interruption time

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

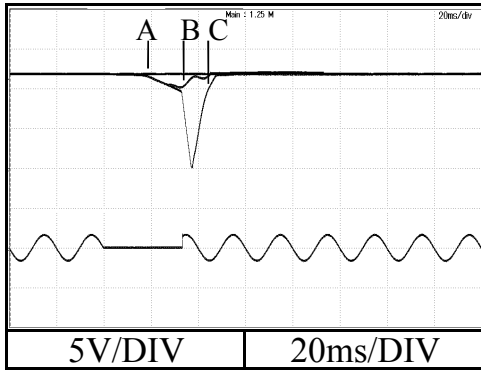
B : 出力電圧の低下が0Vまでいかない Output voltage drop down not reaching 0V.

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

12V

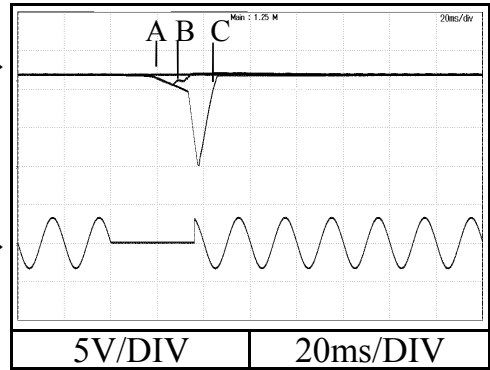
Vin : 115VAC

A = 17ms, B = 27ms, C = 34ms



Vin : 230VAC

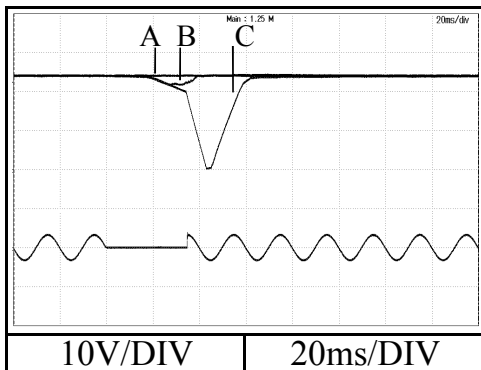
A = 17ms, B = 27ms, C = 36ms



24V

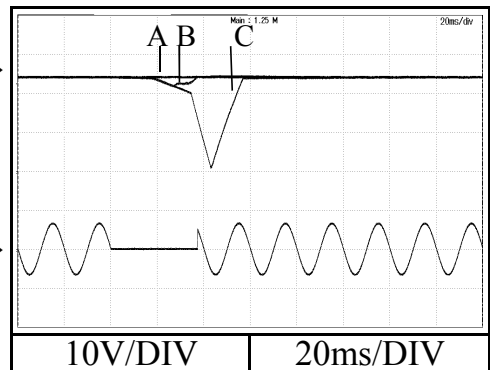
Vin : 115VAC

A = 17ms, B = 27ms, C = 33ms



Vin : 230VAC

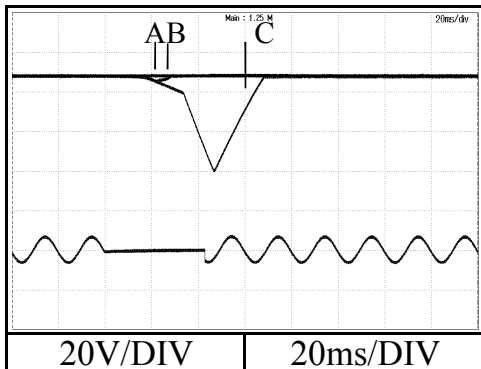
A = 17ms, B = 27ms, C = 37ms



48V

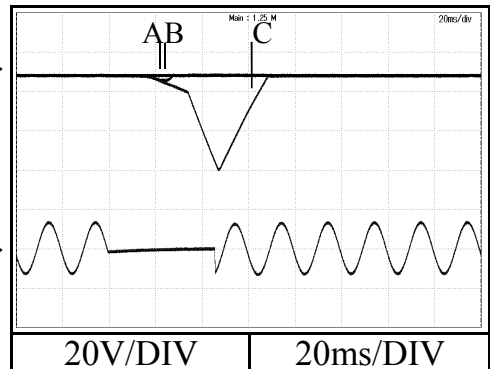
Vin : 115VAC

A = 18ms, B = 22ms, C = 42ms



Vin : 230VAC

A = 18ms, B = 22ms, C = 46ms



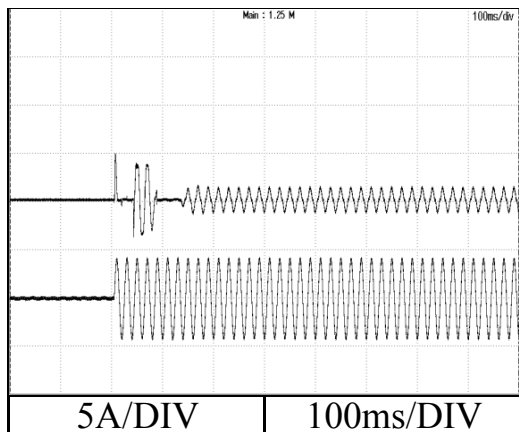
2.10 入力サージ電流 (突入電流) 波形
Inrush current waveform

CME150A

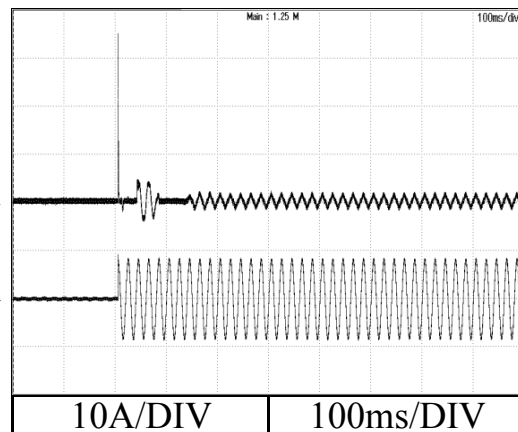
12V

Conditions Vin : 115 VAC
Iout : Full load
Ta : 25 °C

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

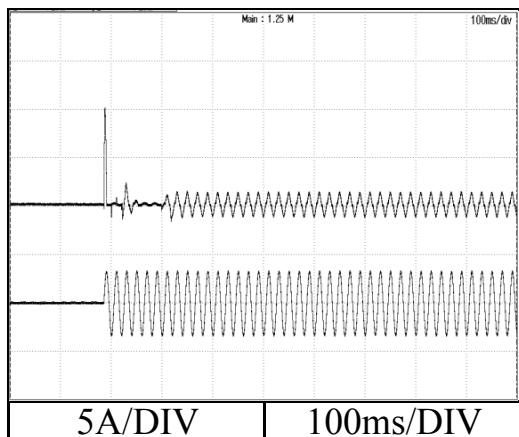


Switch on phase angle of input AC voltage
 $\phi = 90^\circ$

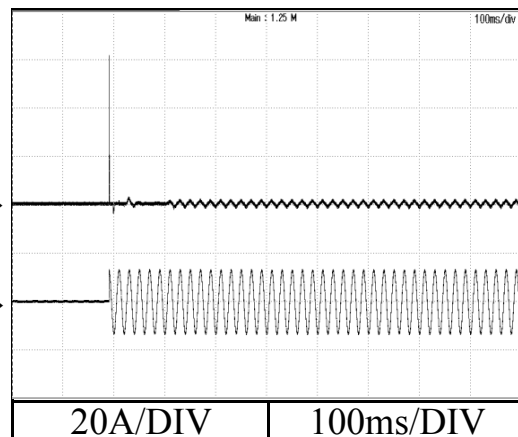


Conditions Vin : 230 VAC
Iout : Full load
Ta : 25 °C

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



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



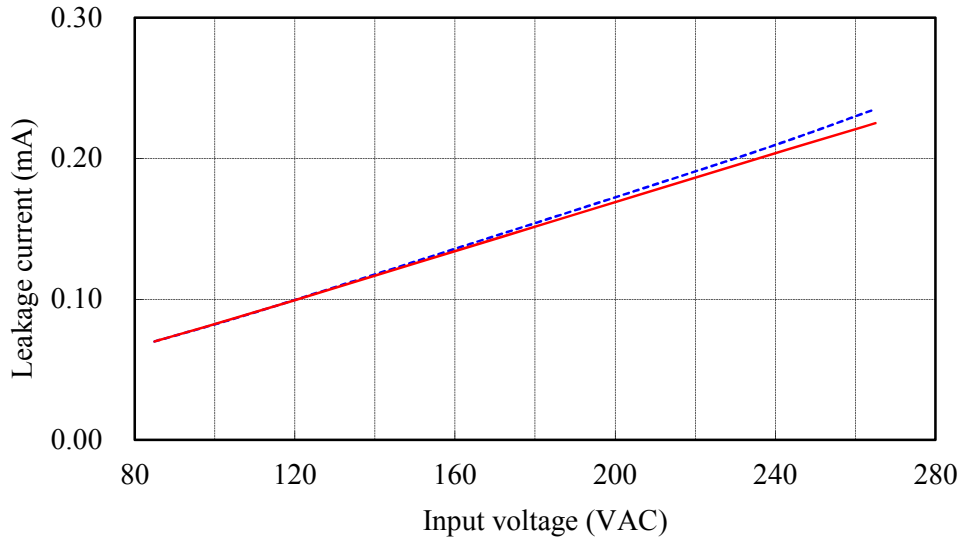
2.11 リーク電流特性
Leakage current characteristics

CME150A

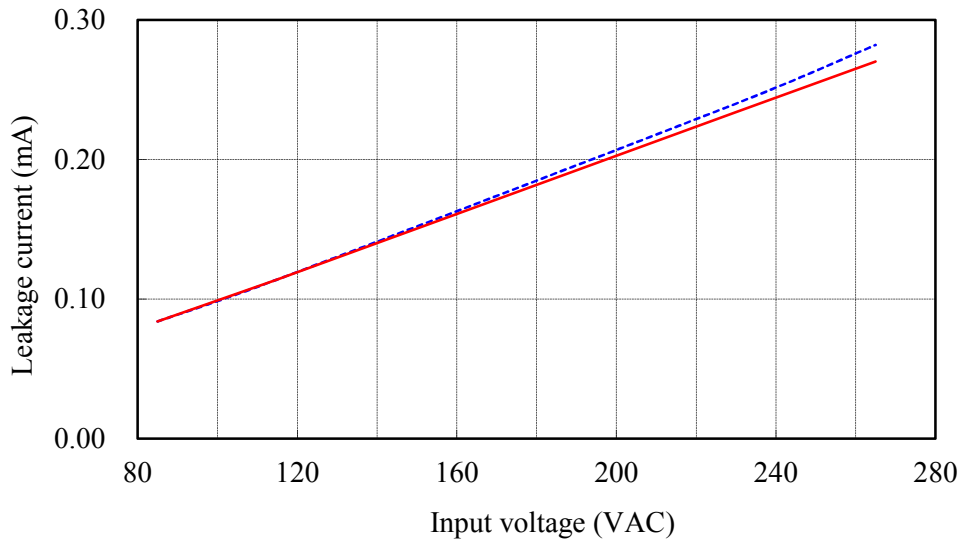
Conditions Iout : 0 % ---
 Full Load ---
 Ta : 25 °C
Equipment used : MODEL 228
 (Simpson)

12V

f : 50 Hz



f : 60 Hz

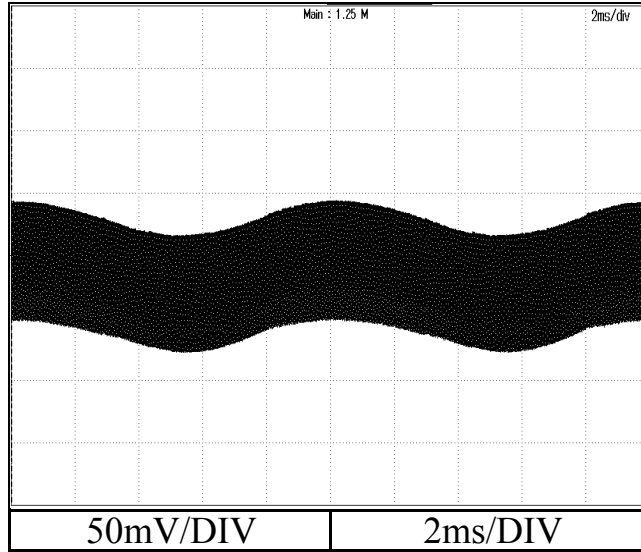


2.13 出力リップル、ノイズ波形
Output ripple and noise waveform

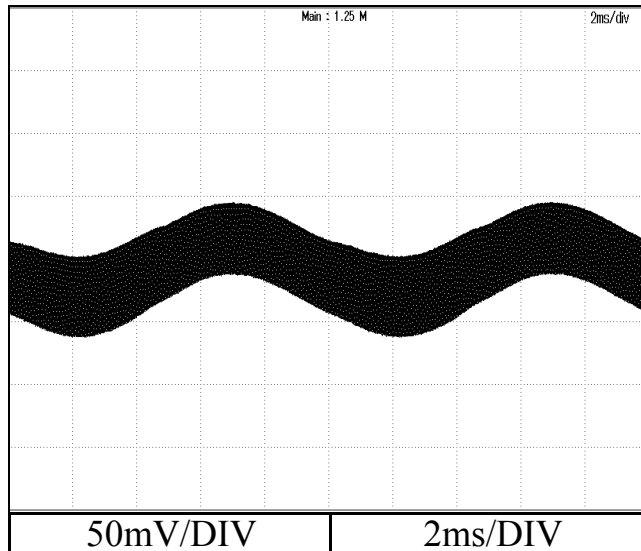
CME150A

Conditions Vin : 115 VAC
Iout : Full load
Ta : 25 °C

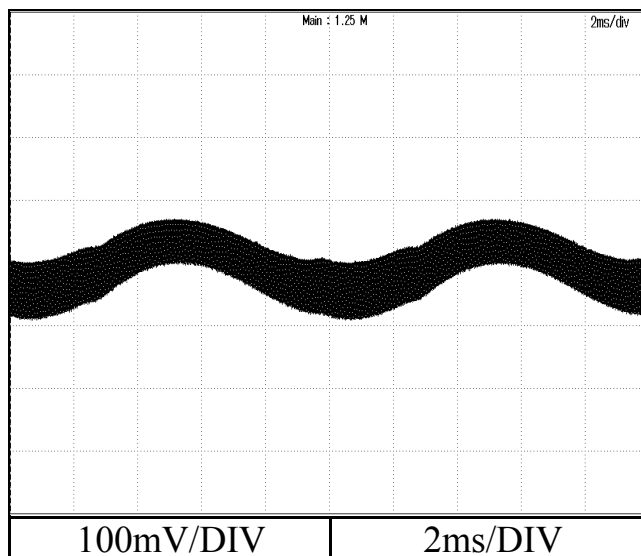
12V



24V



48V



2.14 EMI 特性
Electro-Magnetic Interference characteristics

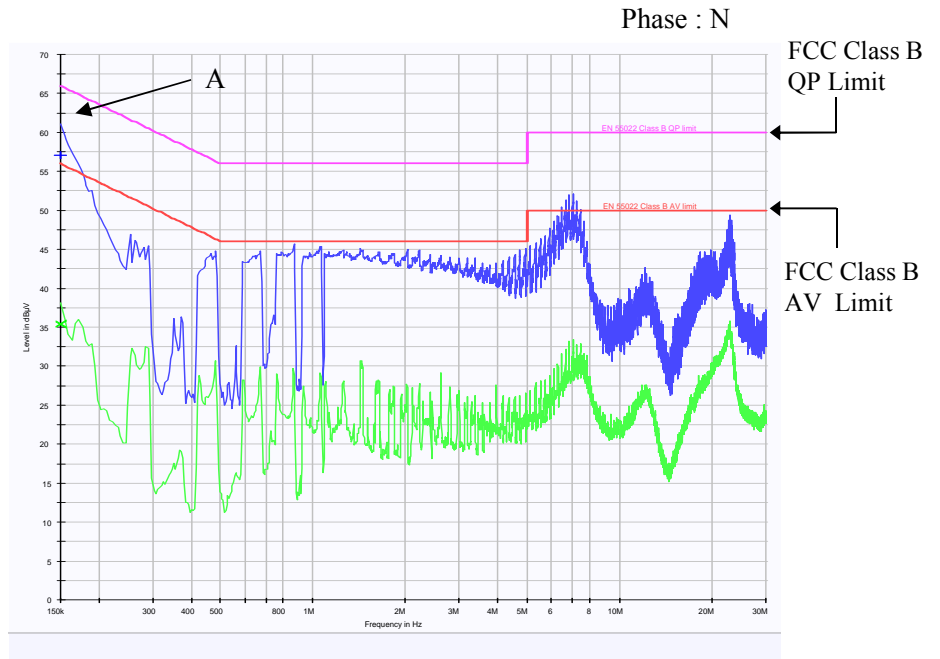
CME150A

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

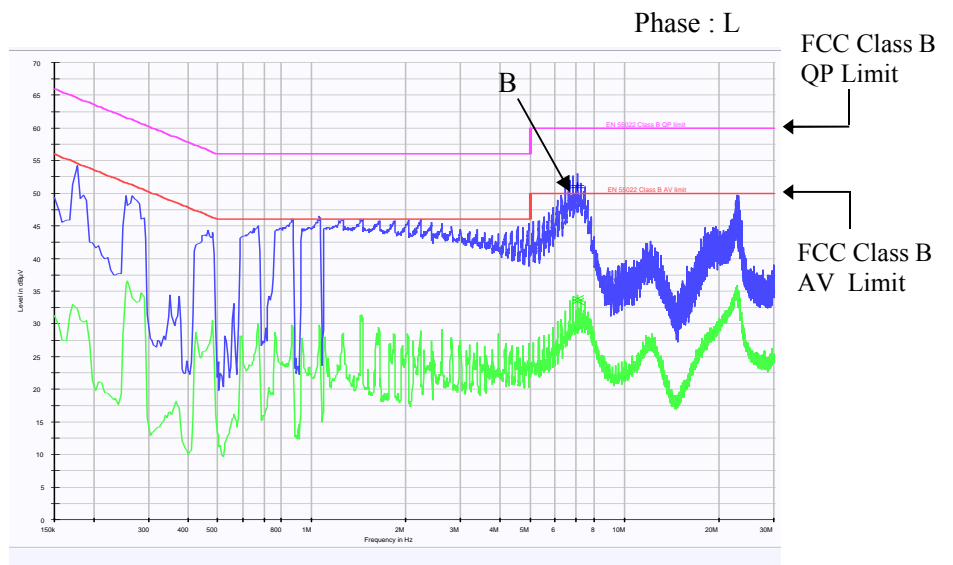
雑音端子電圧
Conducted Emission

12V

Point A (150kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	66.0	57.1
AV	56.0	35.4



Point B (7.063MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	60.0	51.2
AV	50.0	33.9



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

2.14 EMI 特性
Electro-Magnetic Interference characteristics

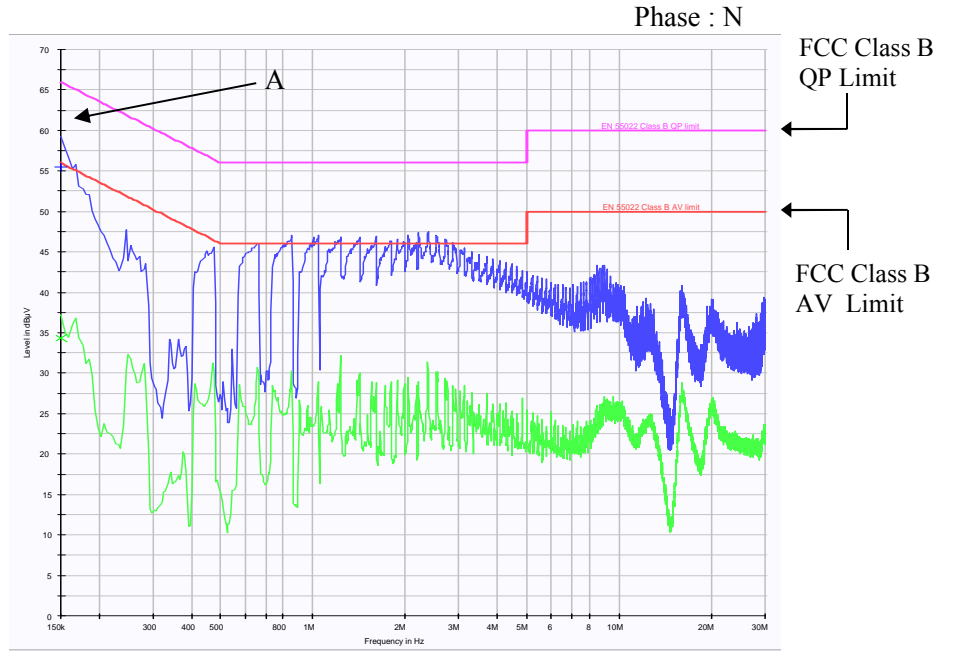
CME150A

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

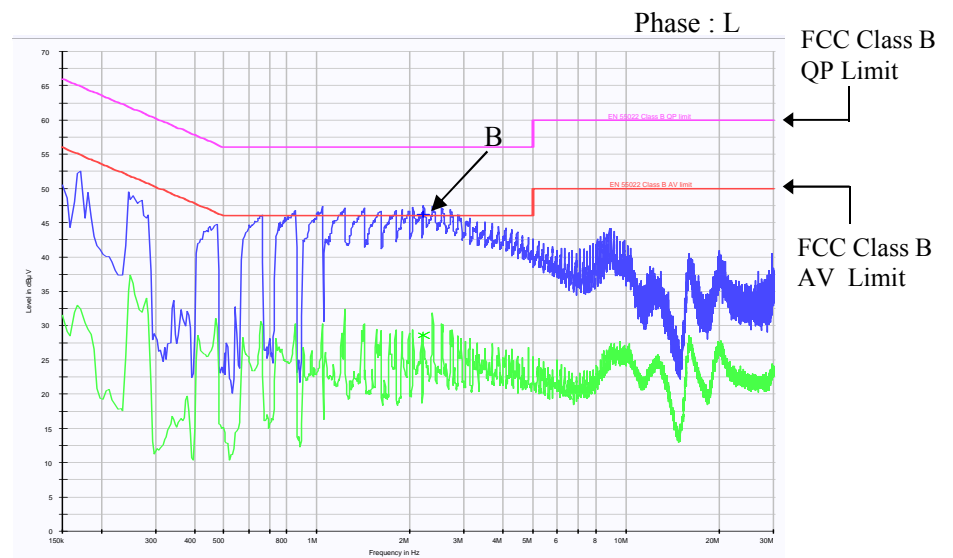
雑音端子電圧
Conducted Emission

24V

Point A (150kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	66.0	55.5
AV	56.0	34.3



Point B (2.205MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	56.0	46.3
AV	46.0	28.6



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

2.14 EMI 特性
Electro-Magnetic Interference characteristics

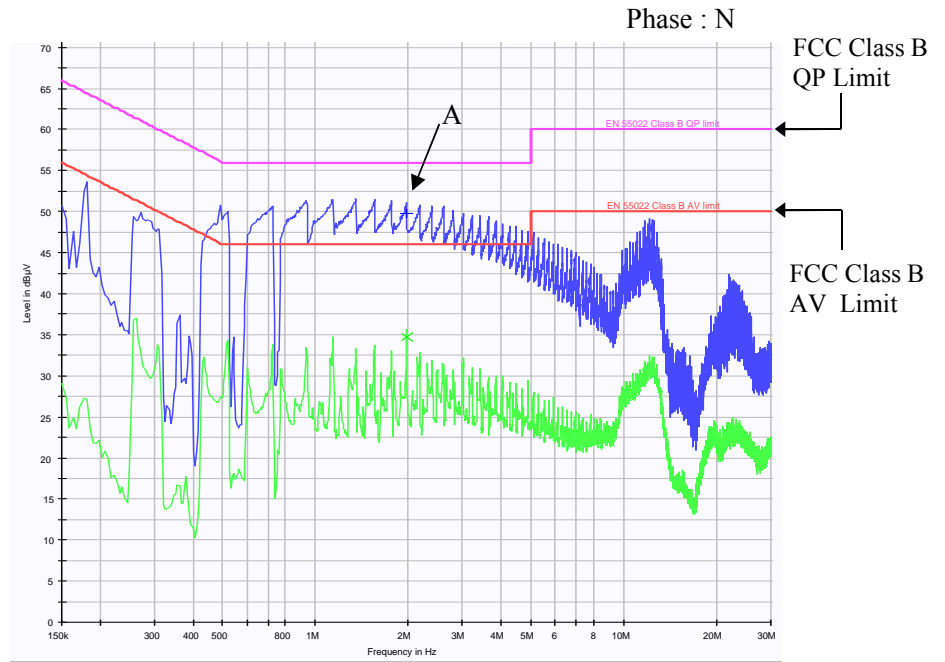
CME150A

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

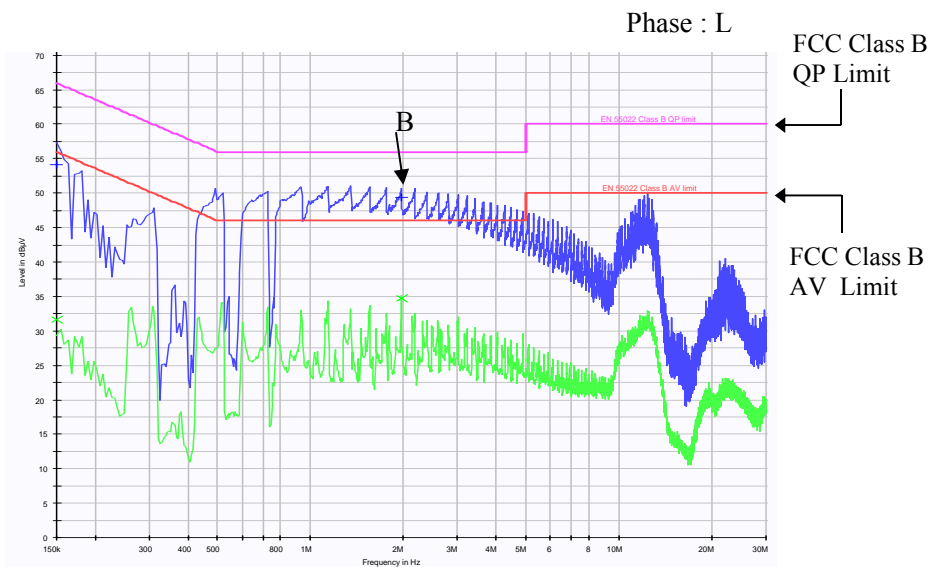
雑音端子電圧
Conducted Emission

48V

Point A (1.975MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	56.0	49.8
AV	46.0	34.7



Point B (1.974MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	56.0	49.4
AV	46.0	34.7



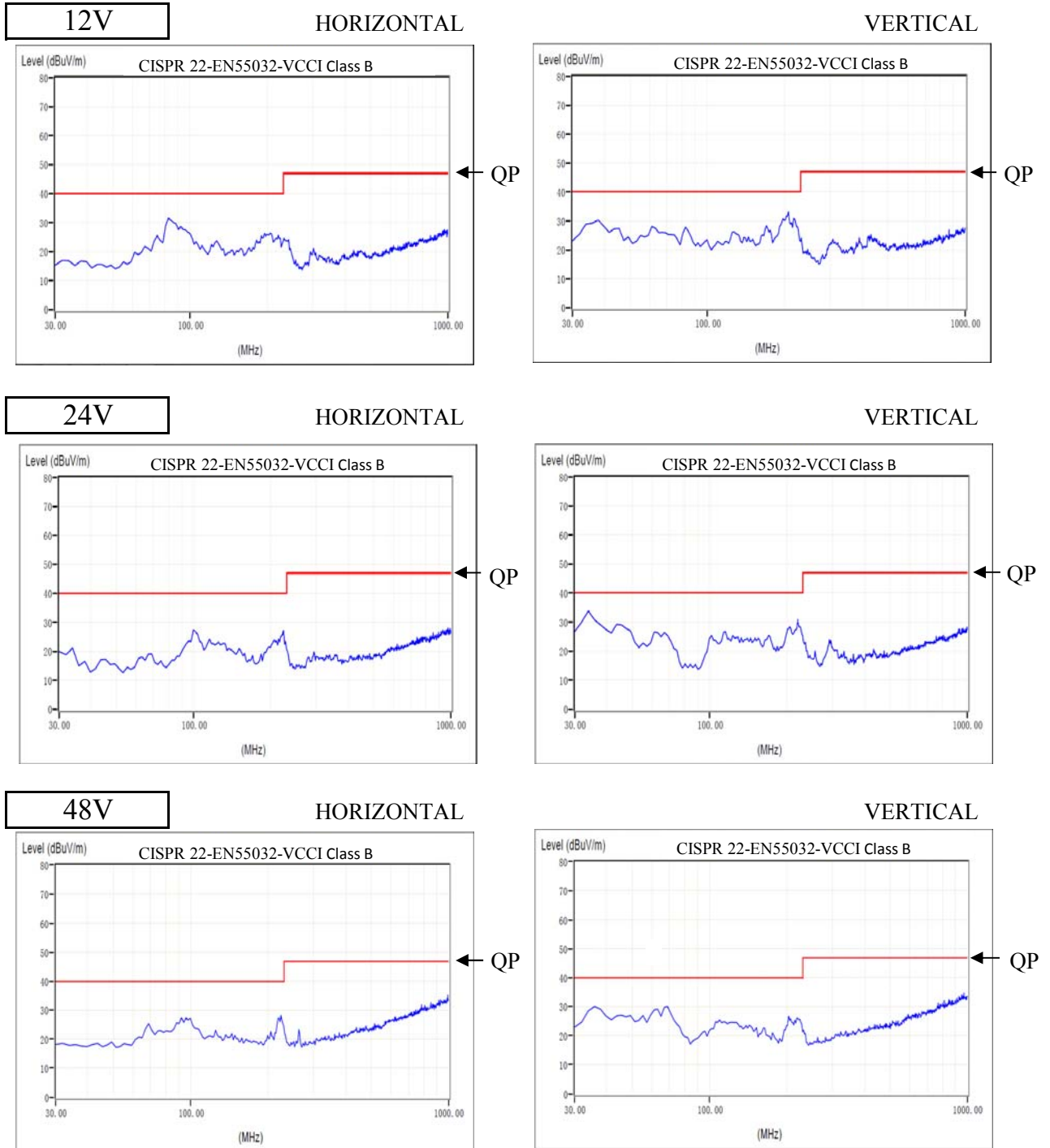
EN55011-B,EN55032-Bの限界値はFCC class Bの限界値と同じ
Limit of EN55011-B,EN55032-B are same as its FCC class B.

2.14 EMI 特性
Electro-Magnetic Interference characteristics

CME150A

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

雑音電界強度
Radiated Emission



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

表示はピーク値
Indication is peak values.