

**CME100A**

**EVALUATION DATA**

**型式データ**

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## 使用記号 Terminology used

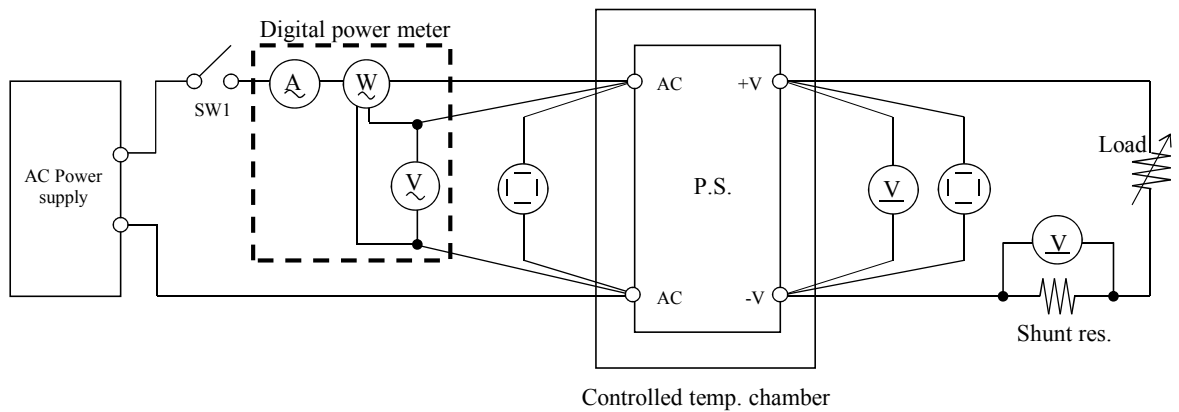
	定義	Definition
$V_{in}$	.....	入力電圧 Input voltage
$V_{out}$	.....	出力電圧 Output voltage
$I_{in}$	.....	入力電流 Input current
$I_{out}$	.....	出力電流 Output current
$T_a$	.....	周囲温度 Ambient temperature
$f$	.....	周波数 Frequency
$V_{stby}$	.....	内蔵補助電源出力電圧 Standby output voltage
$I_{stby}$	.....	内蔵補助電源出力電流 Standby output current

1. 測定方法 Evaluation Method

1.1 測定回路 Circuit used for determination

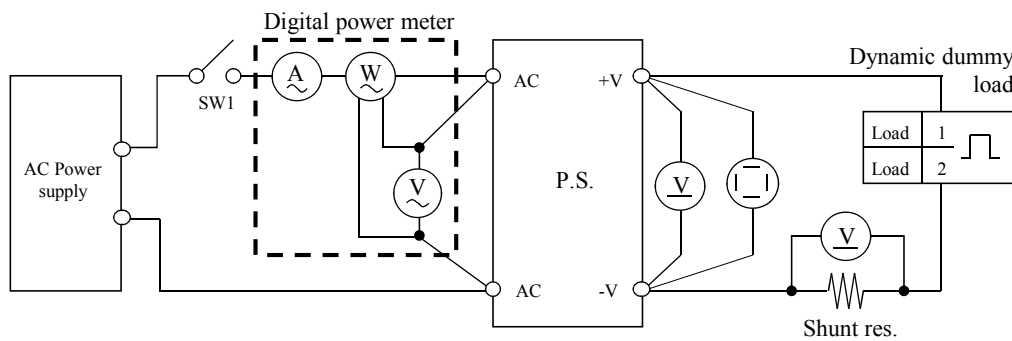
測定回路1 Circuit 1 used for determination

- ・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

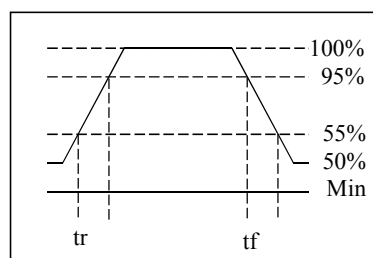


測定回路2 Circuit 2 used for determination

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

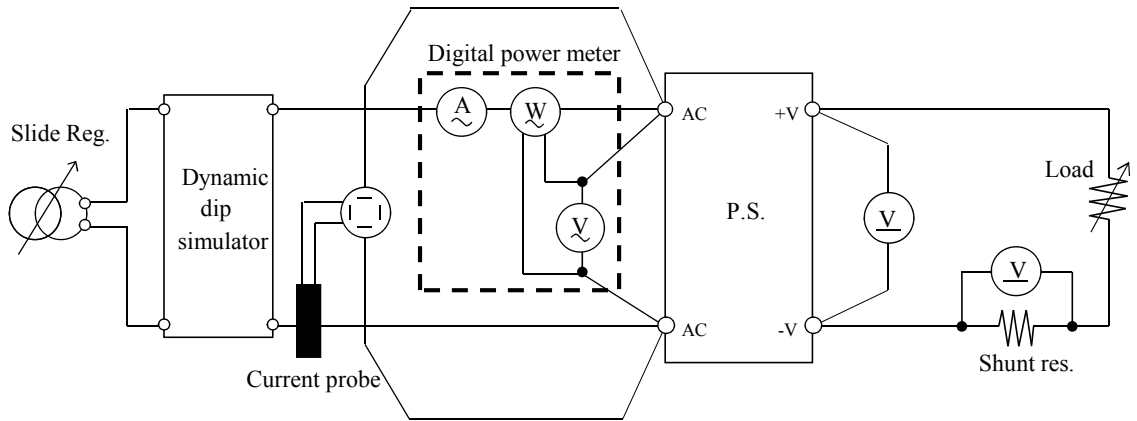


Output current waveform  
Iout 50% <=> 100%



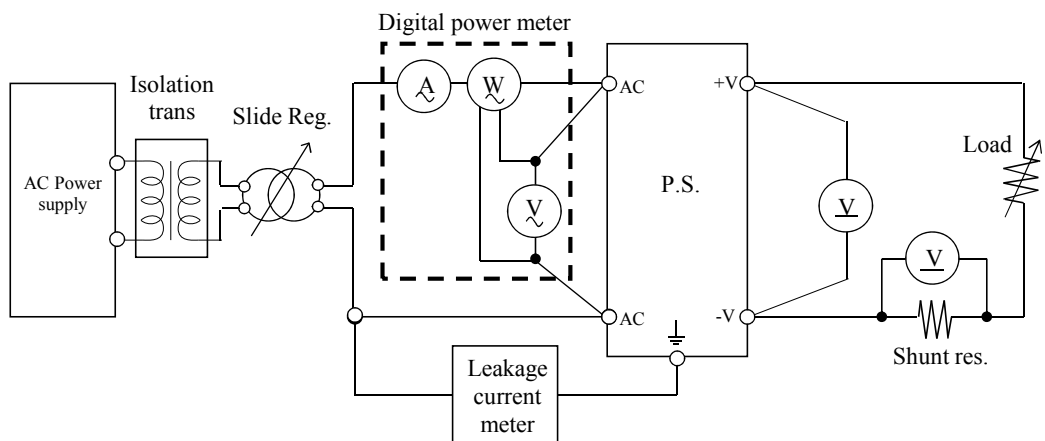
測定回路3 Circuit 3 used for determination

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



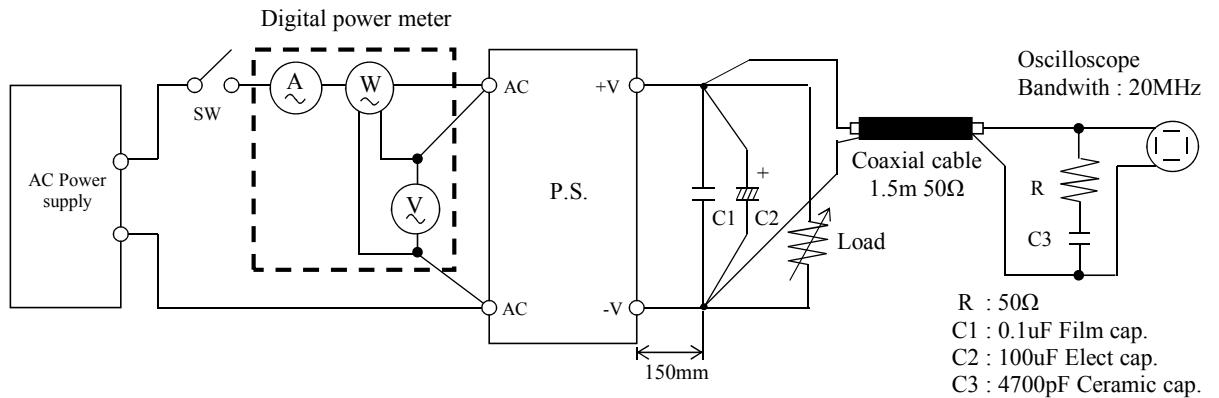
測定回路4 Circuit 4 used for determination

・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

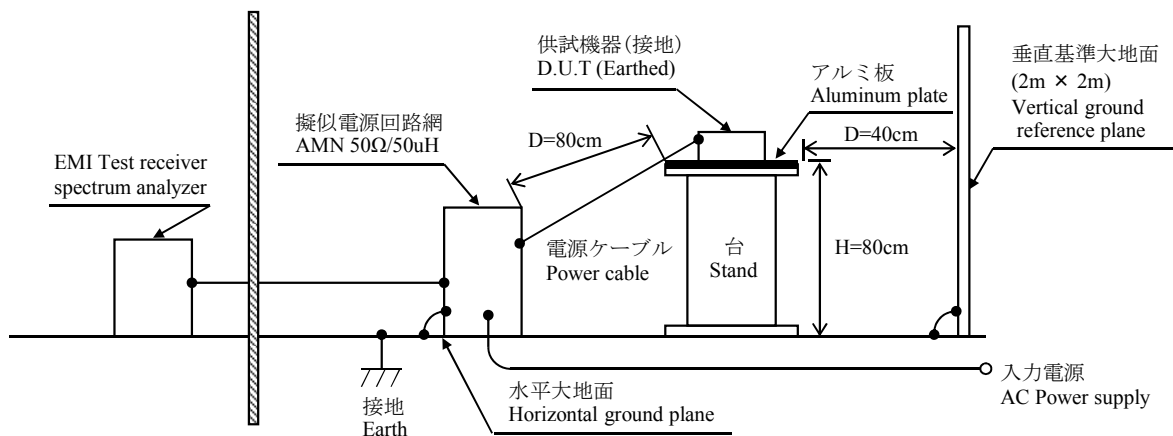


測定構成 Configuration used for determination

EMI特性 Electro-Magnetic Interference characteristics

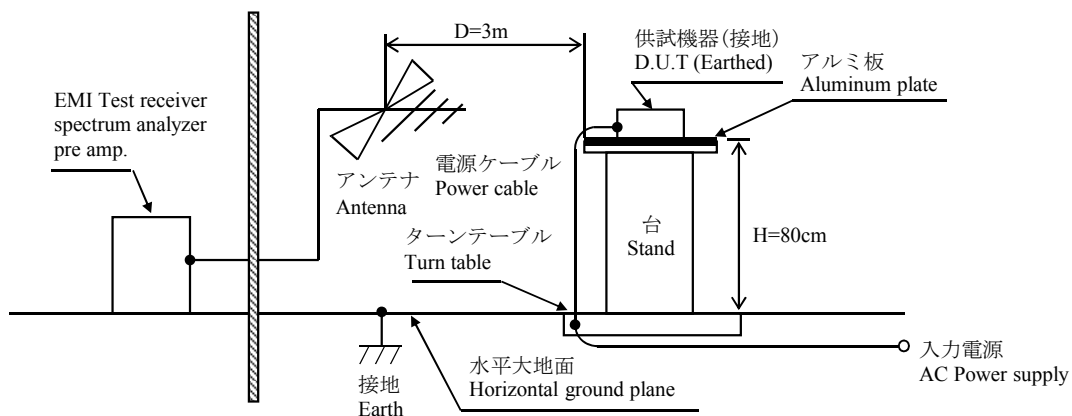
(a) 雑音端子電圧 (帰還ノイズ)

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	34405A/34410A
3	DIGITAL POWER METER	YOKOGAWA ELECT.	WT110 / WT210
4	CURRENT PROBE	YOKOGAWA ELECT.	701930 / 701933
5	DYNAMIC DUMMY LOAD	CHROMA	63640
6	DUMMY LOAD	CHROMA	63640
7	ISOLATION TRANS	TOUZHONG	BJZ-3KVA
8	CVCF	KIKUSUI	PCR2000LE
9	CVCF	CHROMA	61605
10	LEAKAGE CURRENT METER	SIMPSON	228
11	CONTROLLED TEMP. CHAMBER	ESPEC	SU-661 / SH-661
12	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESCI-03
13	PRE AMP.	AGILENT	8447D
14	AMN	SCHWARZBECK	NNLK8121
15	ANTENNA	SCHWARZBECK	VULB9168

## 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 <sub>in</sub>	I <sub>out</sub> : Full load	5V	12V	24V
85VAC	80%	12.8A	6.72A	3.36A
115 - 265VAC	100%	16.0A	8.4A	4.2A

## 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

5V

## 1. Regulation - line and load

Condition Ta : 25 °C

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	line regulation	
0%	5.011V	5.013V	5.012V	5.014V	3mV	0.060%
50%	5.012V	5.016V	5.016V	5.017V	5mV	0.100%
Full load	5.011V	5.015V	5.016V	5.016V	1mV※1	0.020%
Load regulation	1mV	3mV	4mV	3mV		
	0.020%	0.060%	0.080%	0.060%		

## 2. Temperature drift

Conditions Vin : 115 VAC

Iout : Full load

Ta	-20°C	+25°C	+40°C	temperature stability	
Vout	4.975V	5.015V	5.016V	41mV	0.820%

## 3. Start up voltage and Drop out voltage

Conditions Ta : 25 °C

Iout : 100%

Start up voltage (Vin)	78VAC
Drop out voltage (Vin)	71VAC

12V

## 1. Regulation - line and load

Condition Ta : 25 °C

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	line regulation	
0%	12.027V	12.025V	12.024V	12.024V	3mV	0.025%
50%	12.023V	12.023V	12.023V	12.023V	0mV	0.000%
Full load	12.022V	12.022V	12.022V	12.022V	0mV※1	0.000%
Load regulation	5mV	3mV	2mV	2mV		
	0.042%	0.025%	0.017%	0.017%		

## 2. Temperature drift

Conditions Vin : 115 VAC

Iout : Full load

Ta	-20°C	+25°C	+50°C	temperature stability	
Vout	11.983V	12.022V	12.022V	39mV	0.325%

## 3. Start up voltage and Drop out voltage

Conditions Ta : 25 °C

Iout : 100%

Start up voltage (Vin)	78VAC
Drop out voltage (Vin)	72VAC

24V

## 1. Regulation - line and load

Condition Ta : 25 °C

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	line regulation	
0%	24.038V	24.040V	24.040V	24.043V	5mV	0.021%
50%	24.039V	24.040V	24.041V	24.041V	2mV	0.008%
Full load	24.039V	24.039V	24.040V	24.040V	1mV※1	0.004%
Load regulation	1mV	1mV	1mV	3mV		
	0.004%	0.004%	0.004%	0.013%		

## 2. Temperature drift

Conditions Vin : 115 VAC

Iout : Full load

Ta	-20°C	+25°C	+50°C	temperature stability	
Vout	23.986V	24.039V	24.032V	53mV	0.221%

## 3. Start up voltage and Drop out voltage

Conditions Ta : 25 °C

Iout : 100%

Start up voltage (Vin)	78VAC
Drop out voltage (Vin)	71VAC

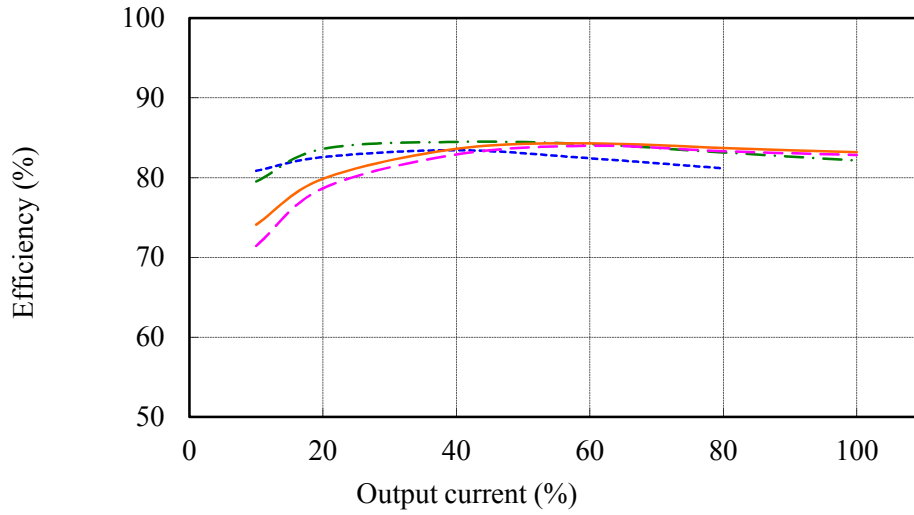
※1 Line regulation : 115VAC - 265VAC

(2) 効率対出力電流

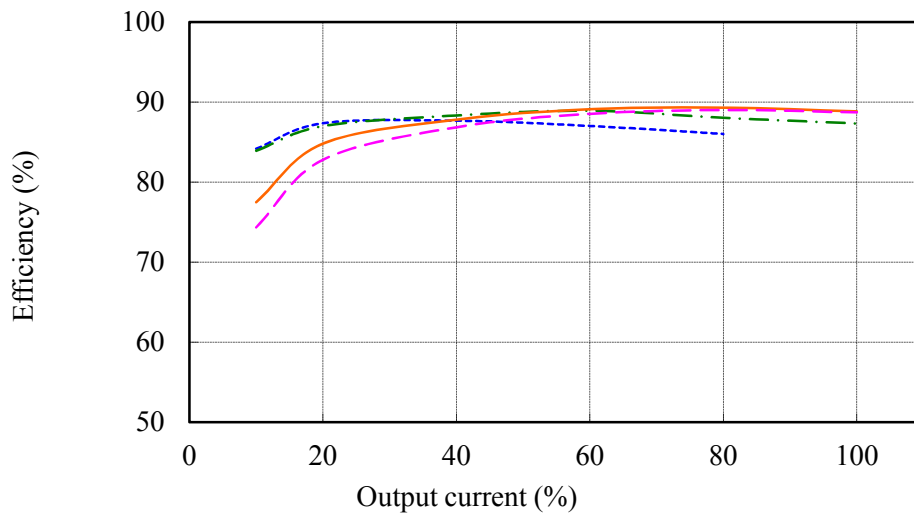
Efficiency vs. Output current

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

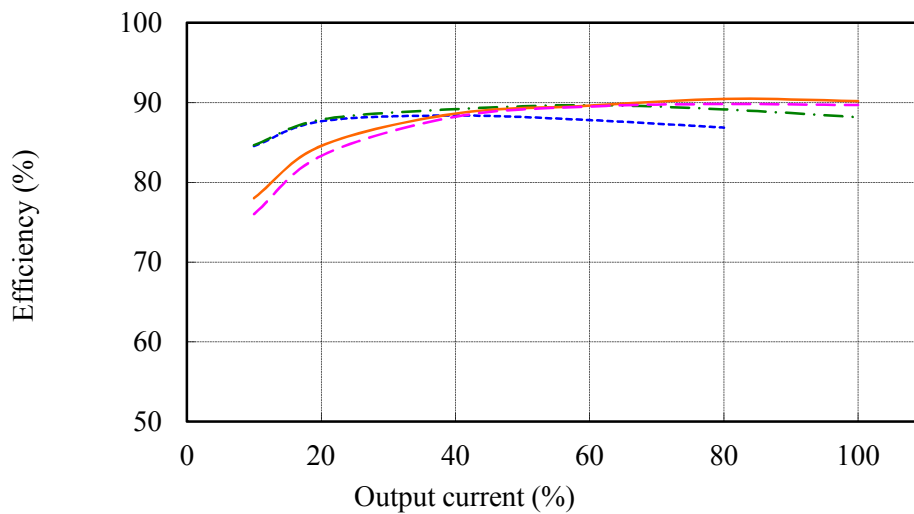
5V



12V



24V



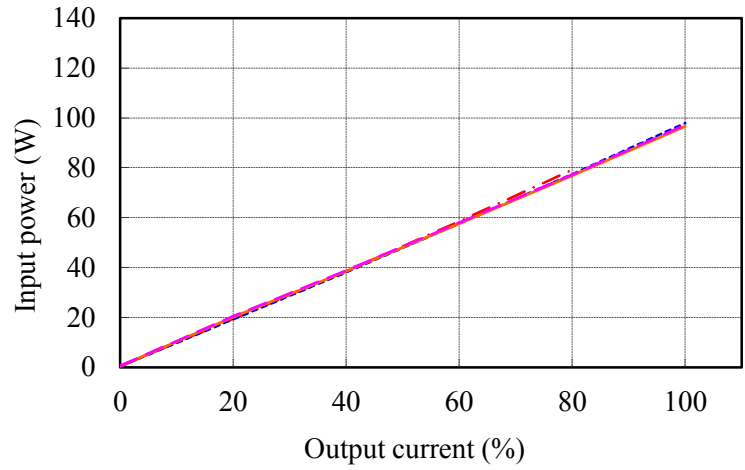
(3) 入力電力対出力電流

Input power vs. Output current

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

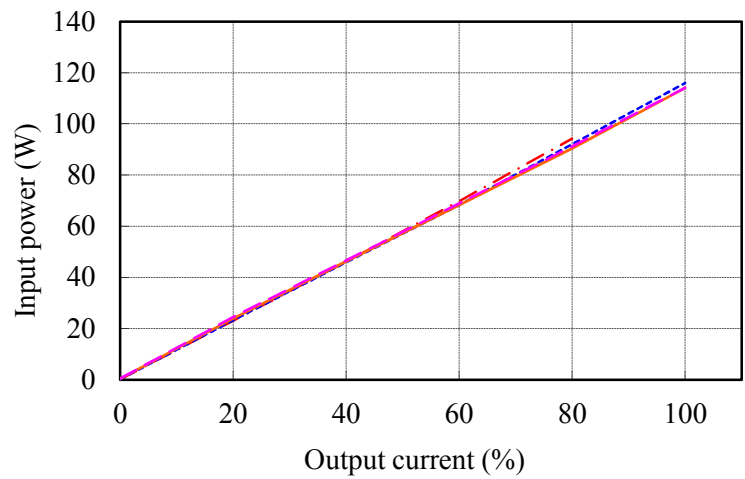
5V

Vin	Input power
	Iout : 0%
85VAC	0.29W
115VAC	0.31W
230VAC	0.48W
265VAC	0.55W



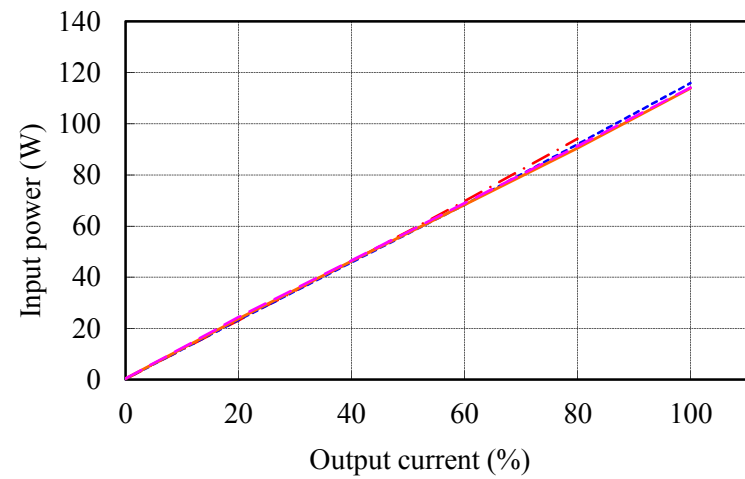
12V

Vin	Input power
	Iout : 0%
85VAC	0.22W
115VAC	0.24W
230VAC	0.38W
265VAC	0.45W



24V

Vin	Input power
	Iout : 0%
85VAC	0.00W
115VAC	0.27W
230VAC	0.28W
265VAC	0.44W



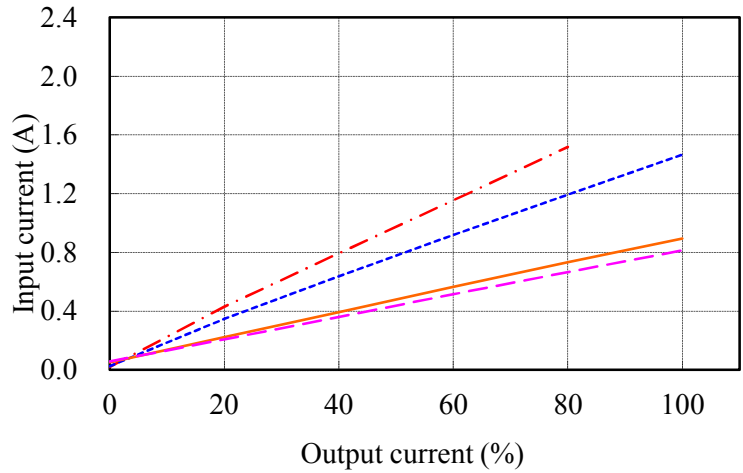
(4) 入力電流対出力電流

Input current vs. Output current

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

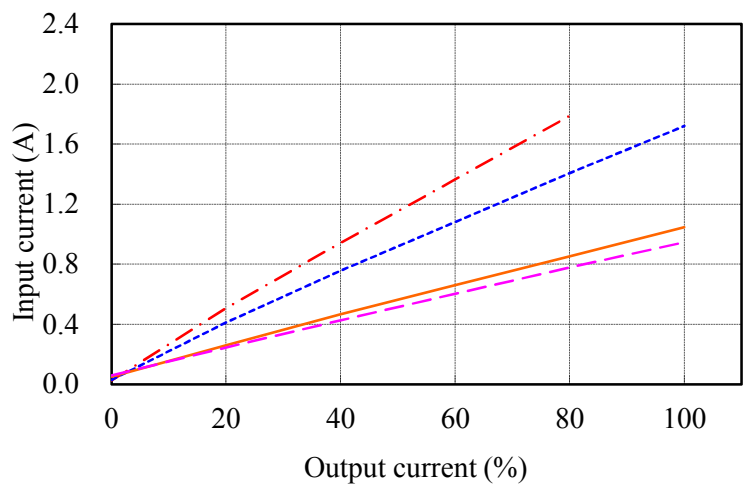
5V

Vin	Input current
	Iout : 0%
85VAC	0.02A
115VAC	0.03A
230VAC	0.05A
265VAC	0.06A



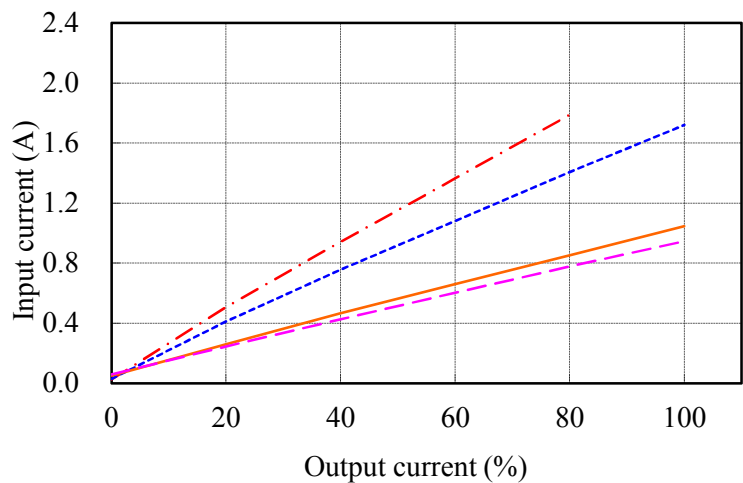
12V

Vin	Input current
	Iout : 0%
85VAC	0.02A
115VAC	0.03A
230VAC	0.05A
265VAC	0.06A



24V

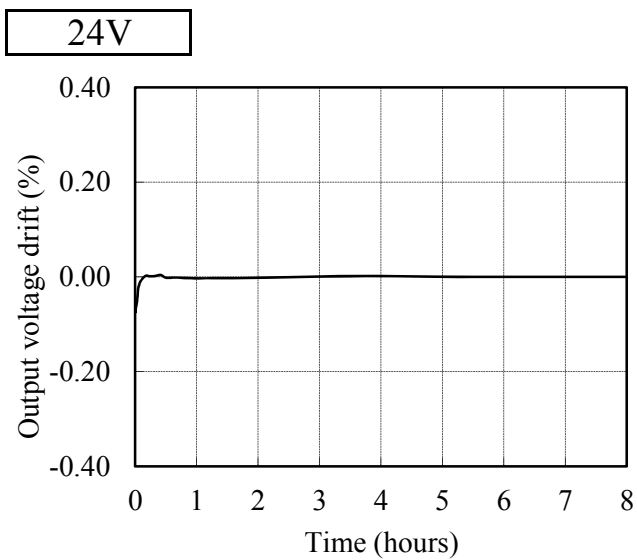
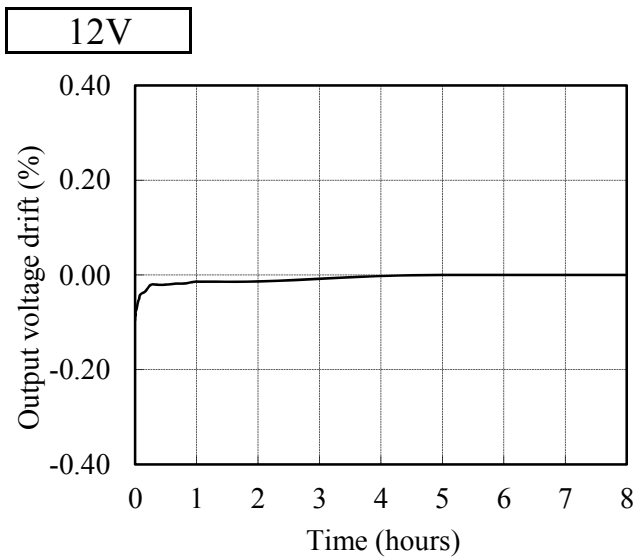
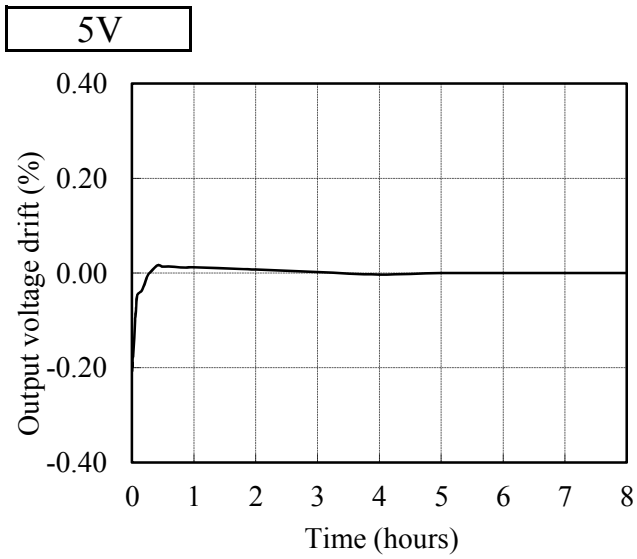
Vin	Input current
	Iout : 0%
85VAC	0.00A
115VAC	0.02A
230VAC	0.02A
265VAC	0.04A



## 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

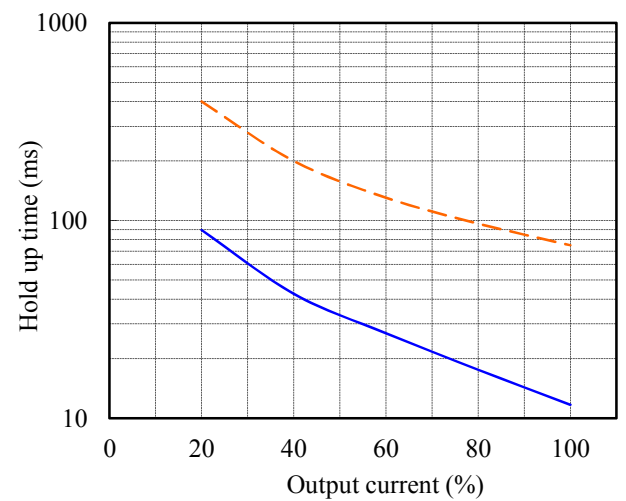
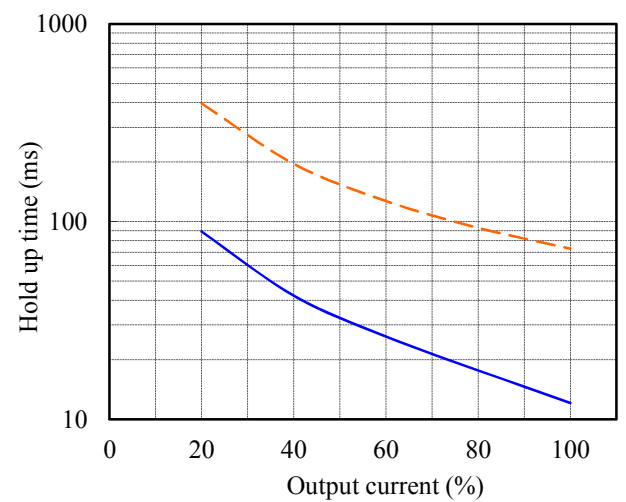
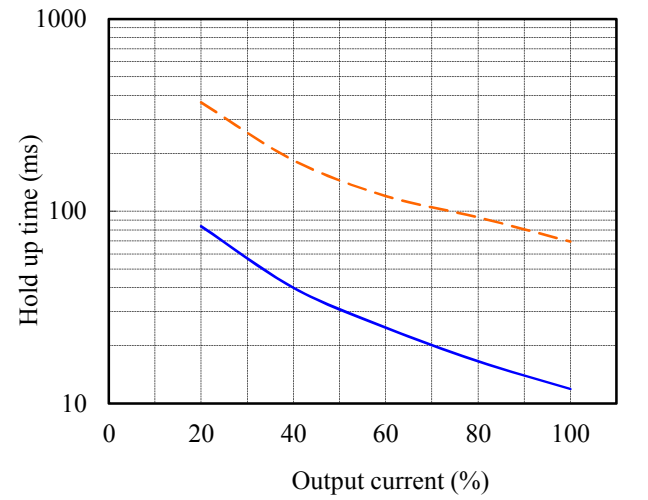


## 2.3 出力保持時間特性

### CME100A

### Hold up time characteristics

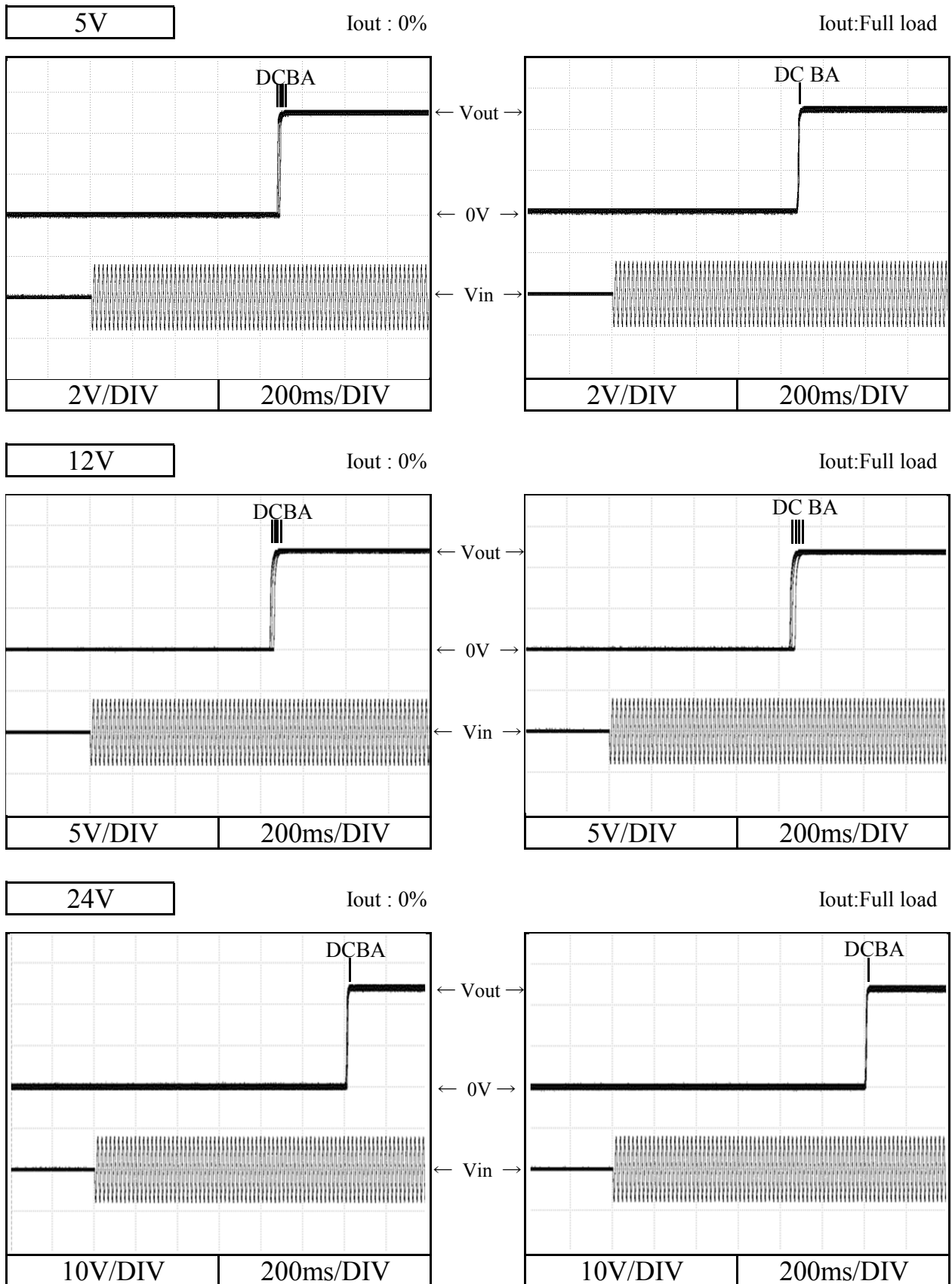
Conditions Vin : 115 VAC  
230 VAC  
Ta : 25 °C



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

CME100A

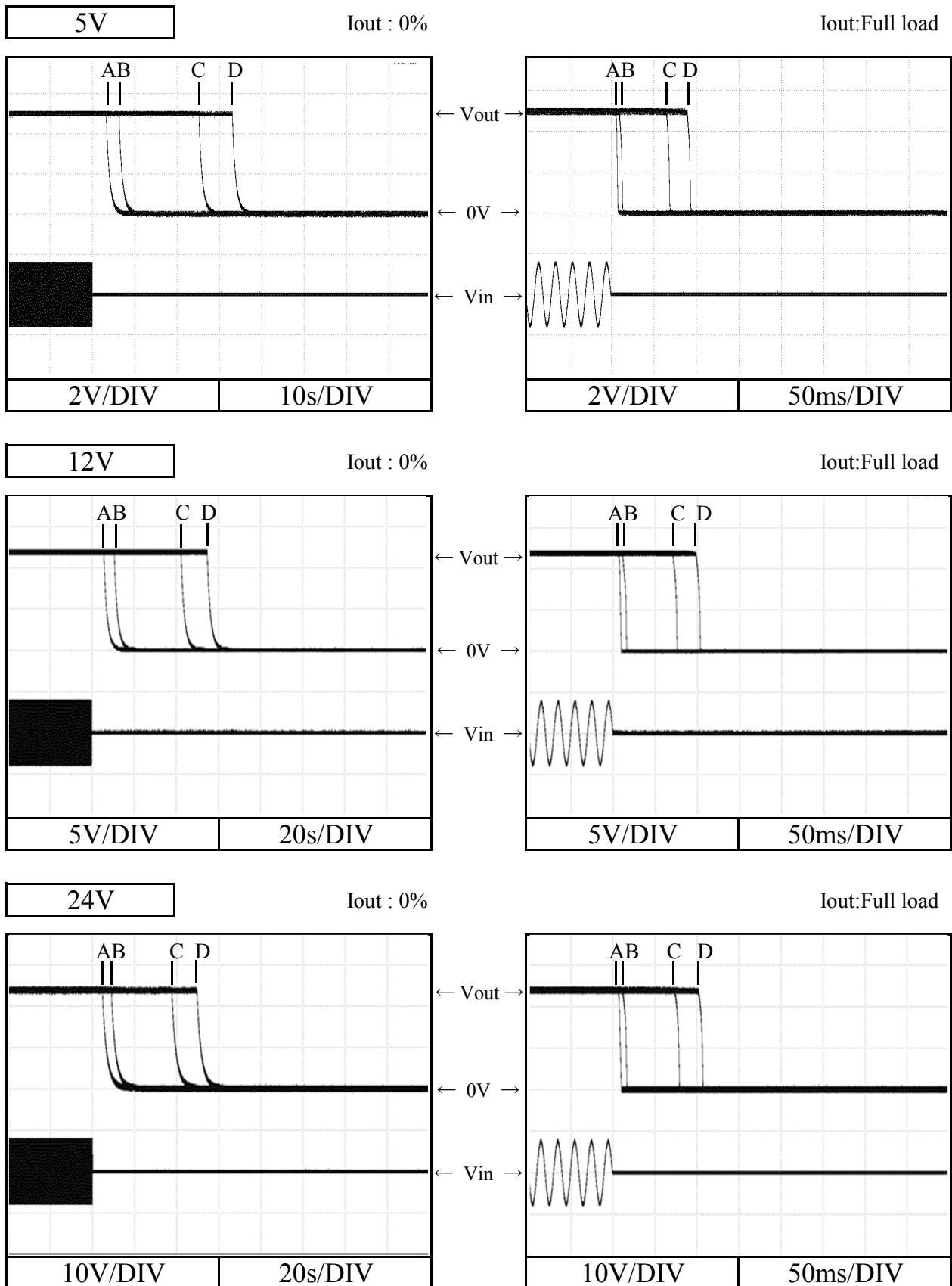
Conditions Vin : 85 VAC (A)  
115 VAC (B)  
230 VAC (C)  
265 VAC (D)  
Ta : 25 °C



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

CME100A

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

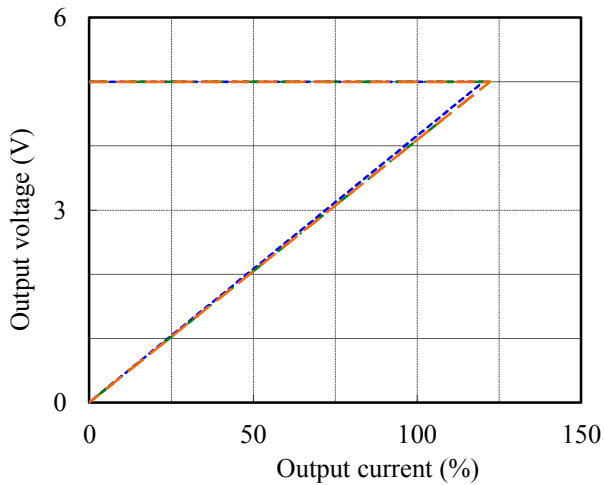


2.6 過電流保護特性  
Over current protection (OCP) characteristics

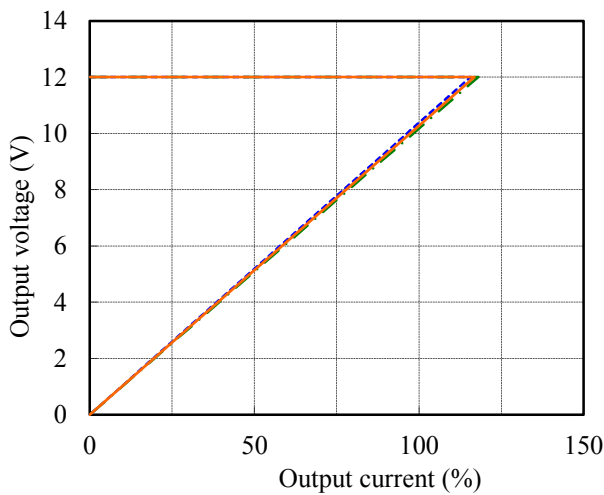
Conditions Vin : 115 VAC

Ta : -20 °C (Blue dashed line)  
 25 °C (Green dash-dot line)  
 40 °C (Red dashed line)  
 50 °C (Red solid line)

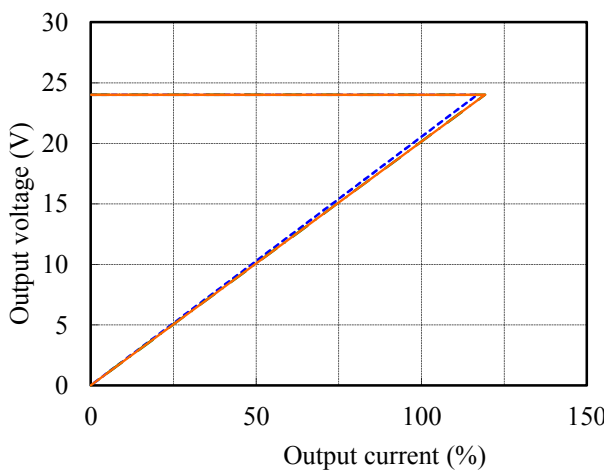
5V



12V



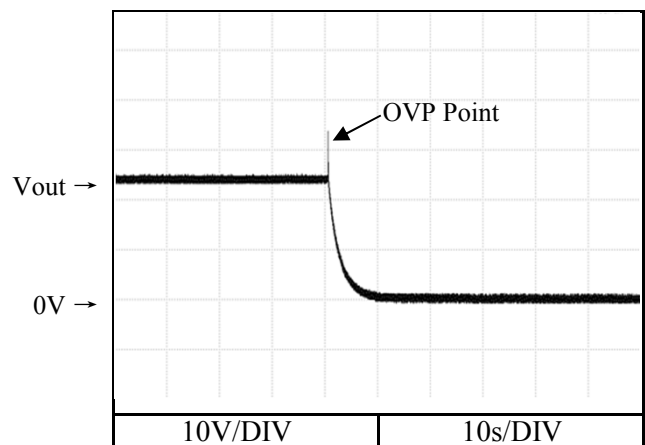
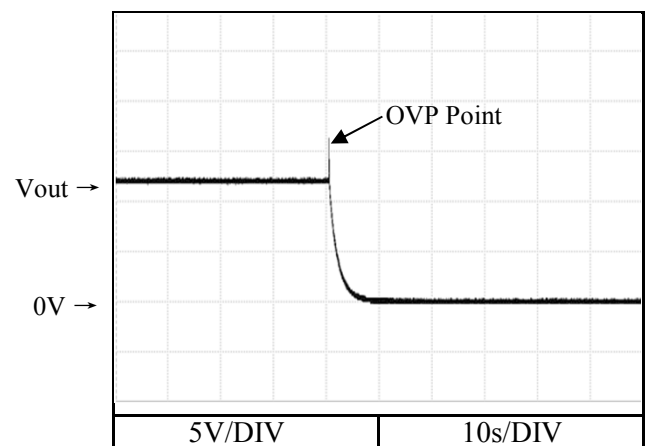
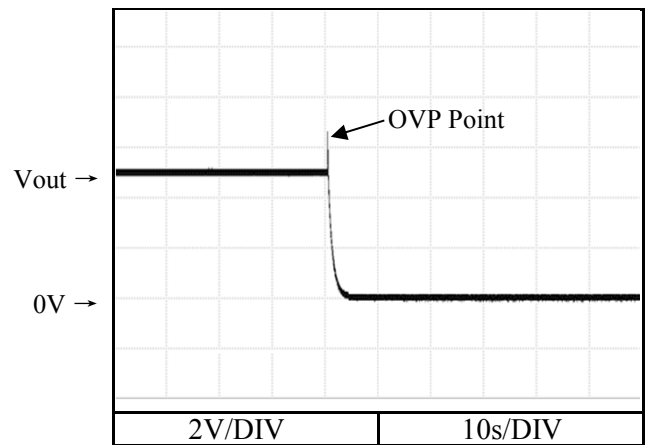
24V



2.7 過電圧保護特性  
Over voltage protection (OVP) characteristics

Conditions Vin : 115 VAC

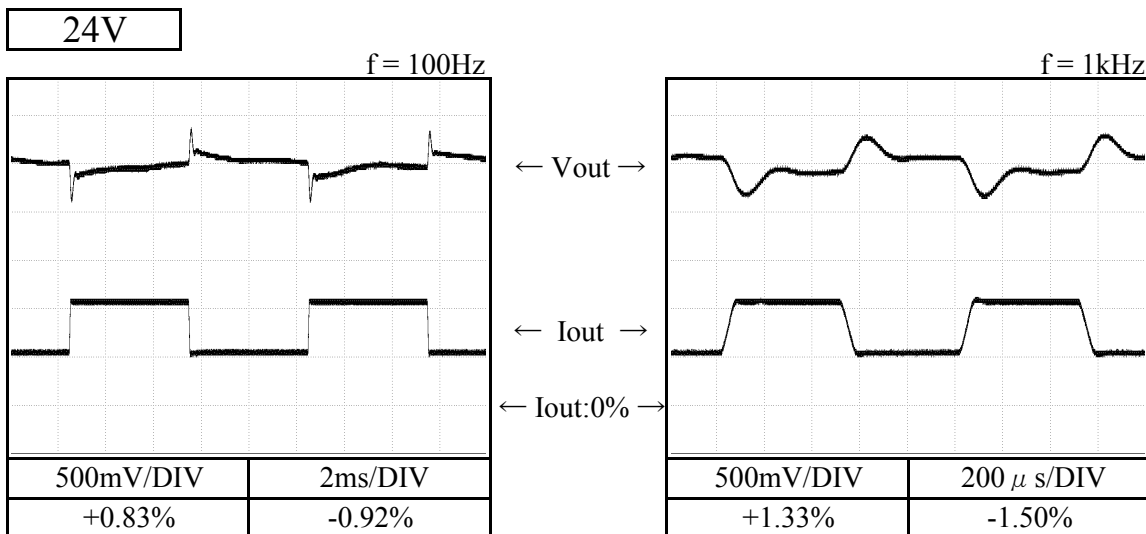
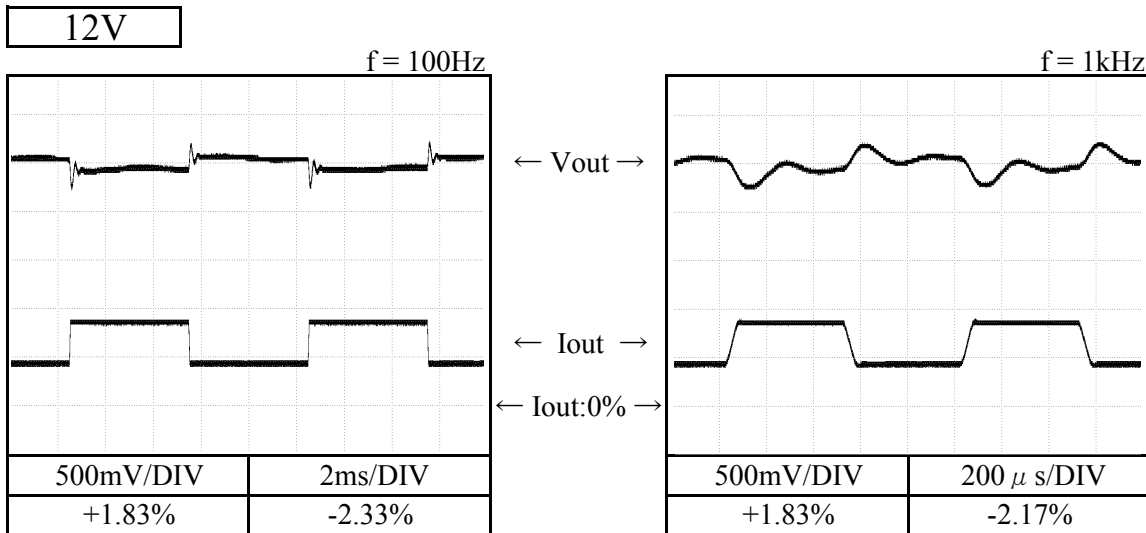
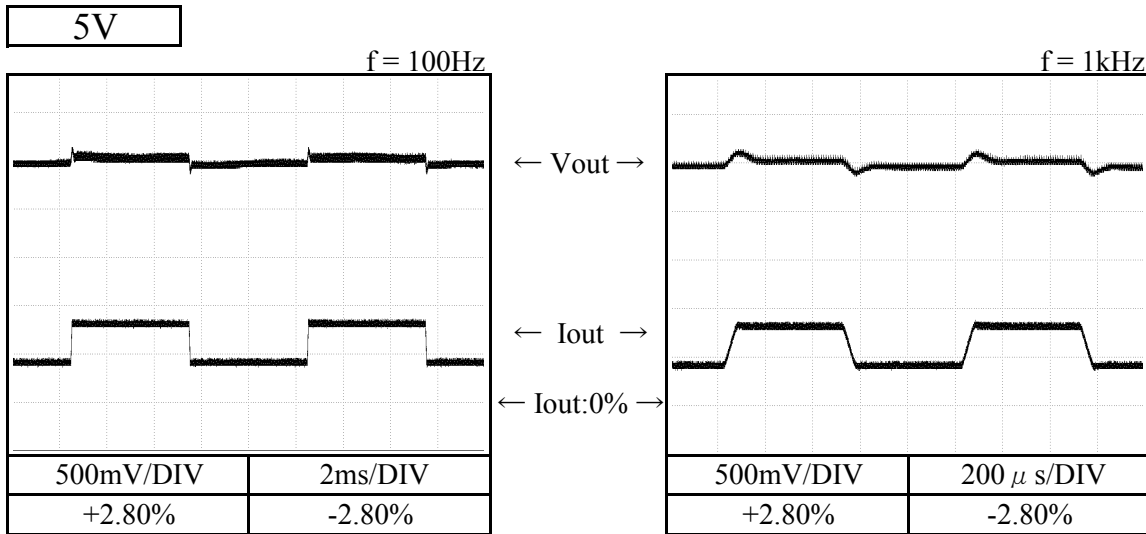
Iout : 0 %  
 Ta : 25 °C



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

CME100A

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

# CME100A

Conditions Ta : 25 °C

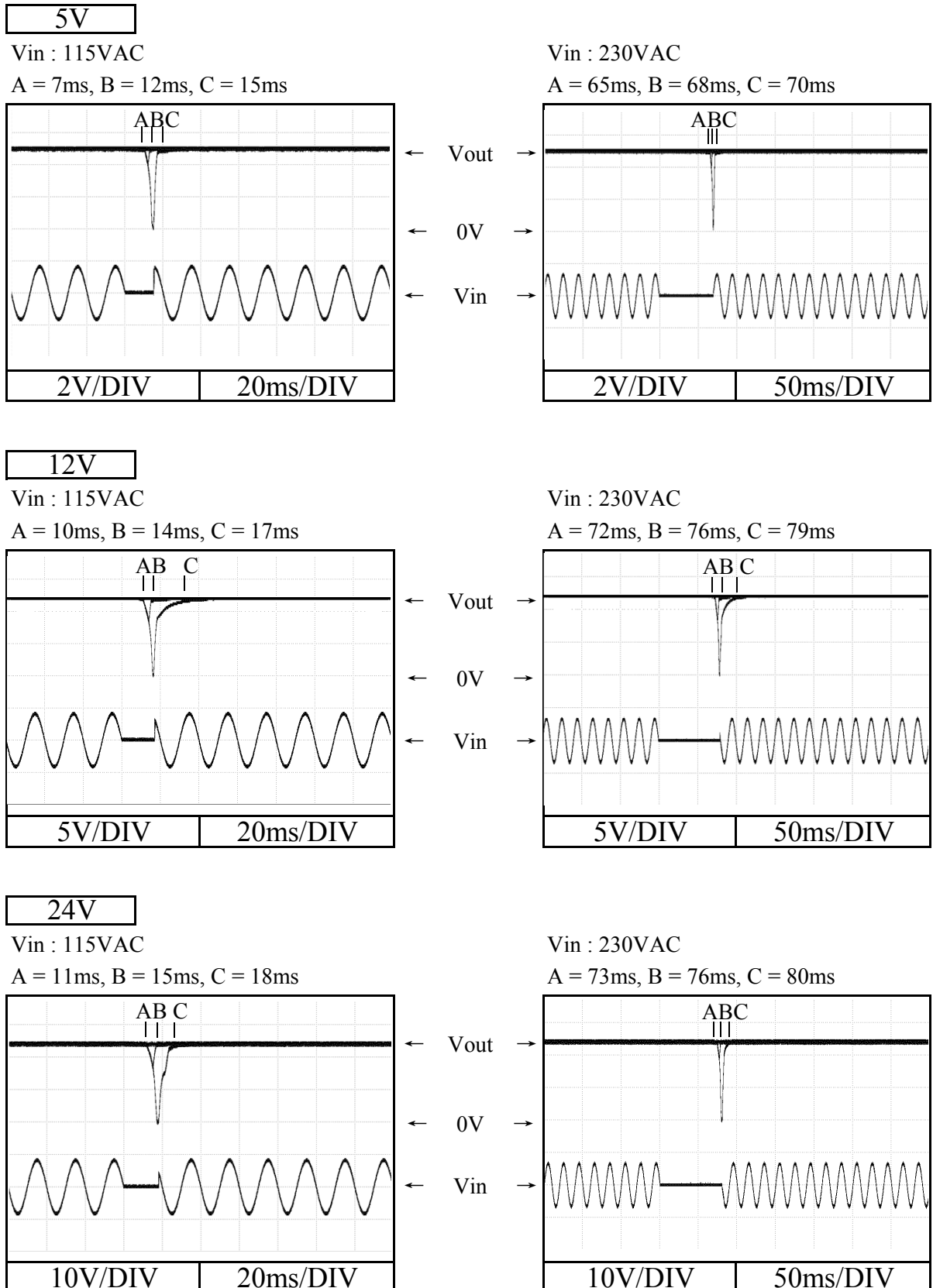
Iout : Full load

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.



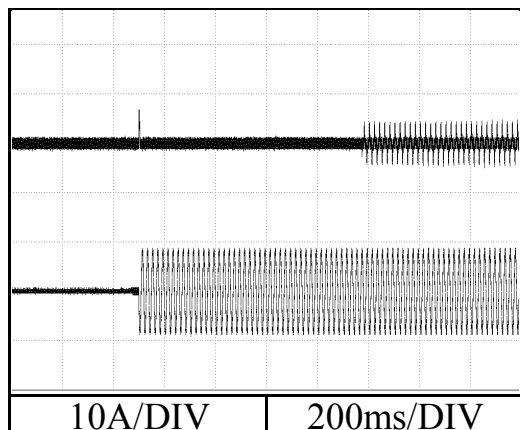
2.10 入力サージ電流 (突入電流) 波形  
Inrush current waveform

CME100A

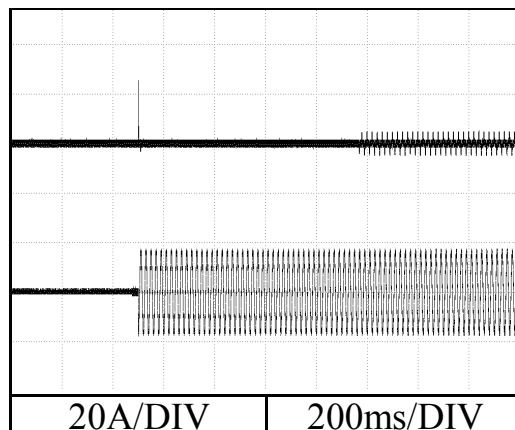
5V

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

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

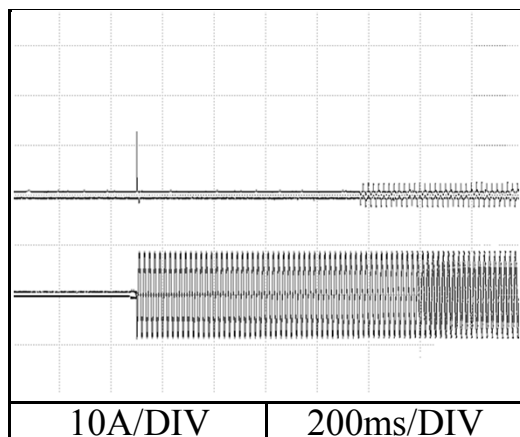


Switch on phase angle of input AC voltage  
 $\phi = 90^\circ$

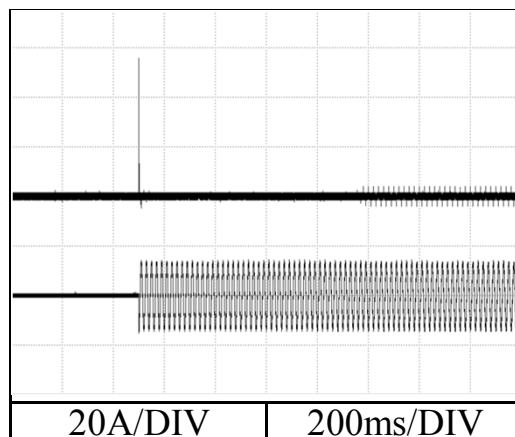


Conditions Vin : 230 VAC  
Iout : Full load  
Ta : 25 °C

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



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



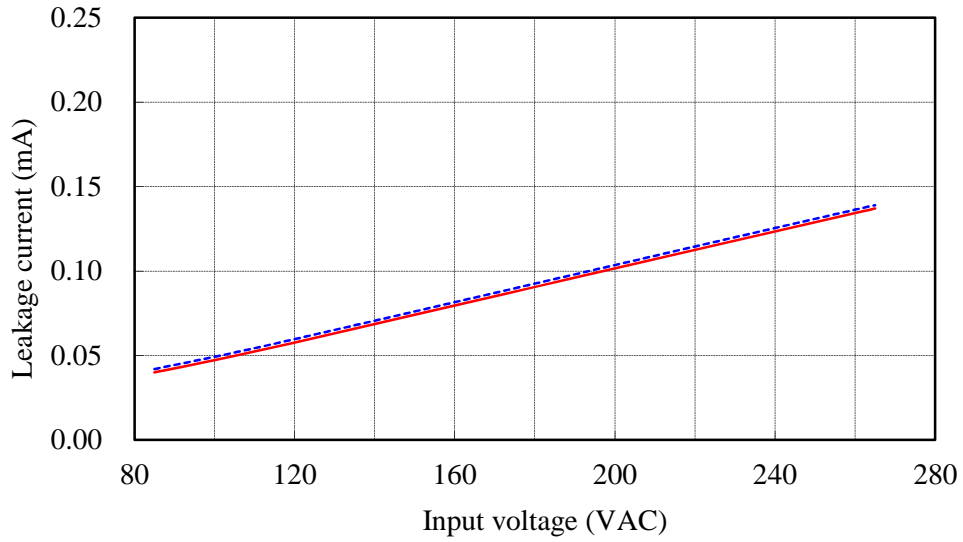
2.11 リーク電流特性  
Leakage current characteristics

CME100A

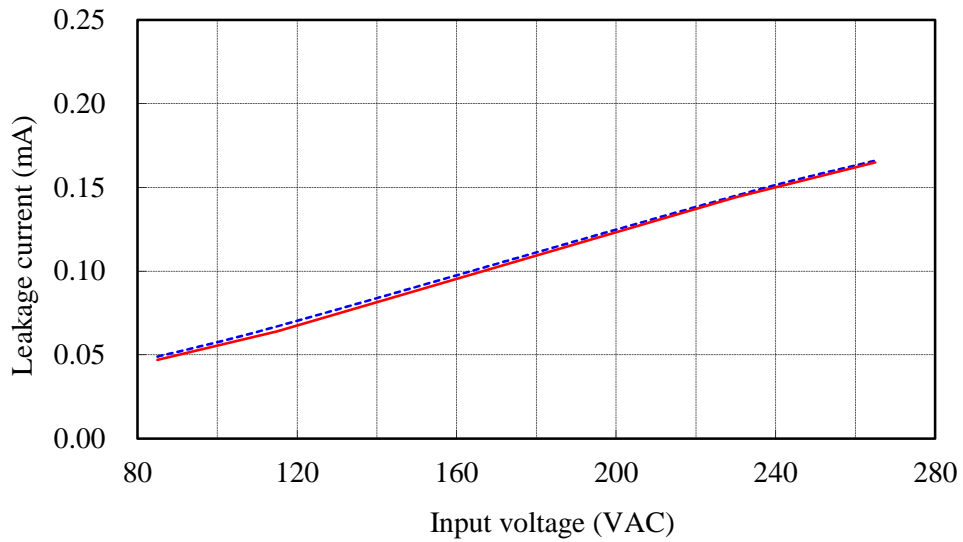
Conditions Iout : 0 %    ---  
                  Full Load    ---  
                  Ta : 25 °C  
Equipment used : MODEL 228  
                                  (Simpson)

5V

f : 50 Hz



f : 60 Hz

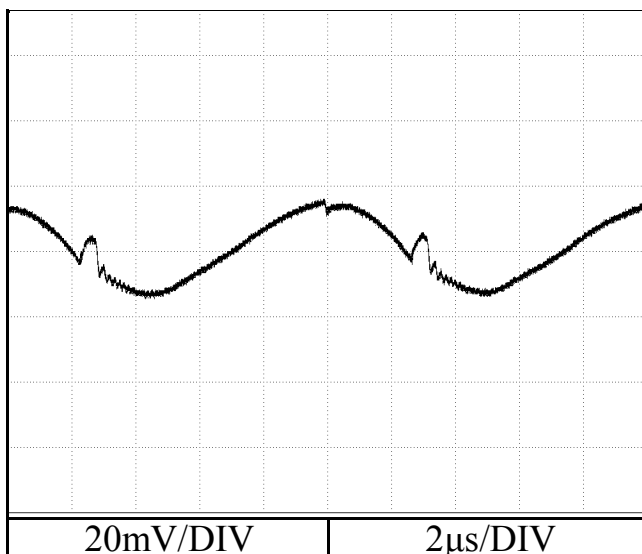


2.13 出力リップル、ノイズ波形  
Output ripple and noise waveform

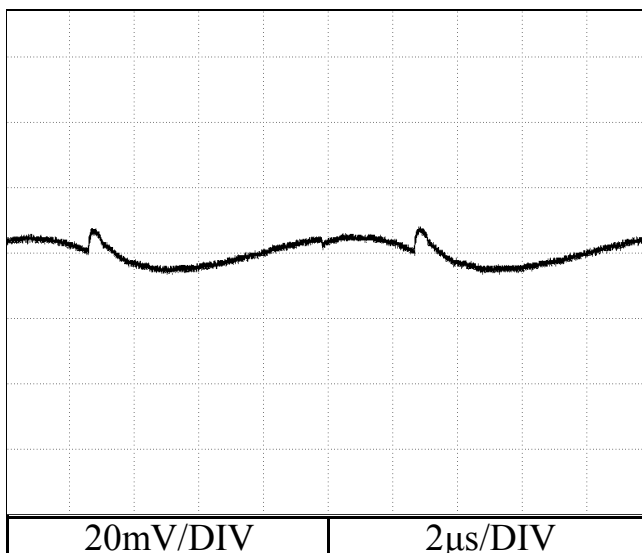
CME100A

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

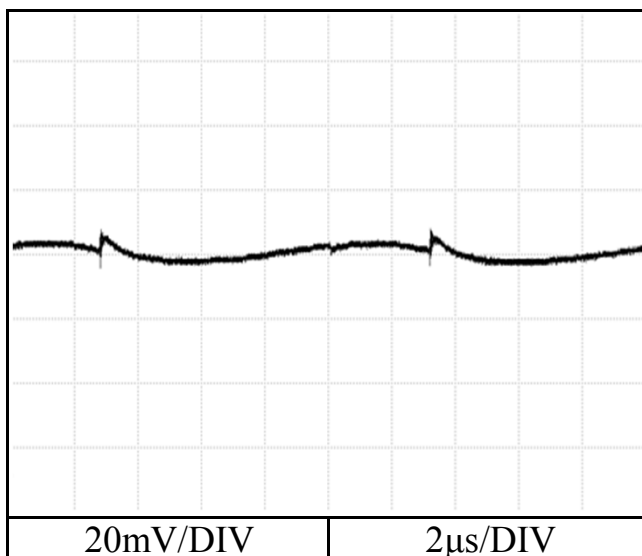
5V



12V



24V



2.14 EMI 特性

Electro-Magnetic Interference characteristics

CME100A

Conditions Vin : 230 VAC

Iout : Full load

Ta : 25 °C

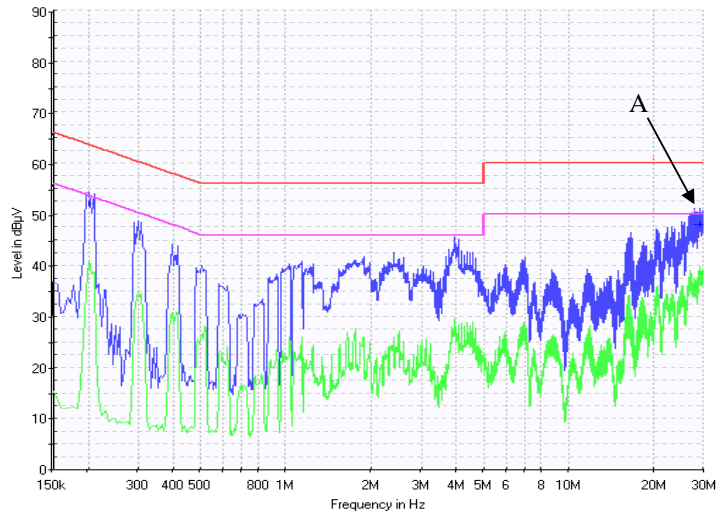
雑音端子電圧

Conducted Emission

5V

Phase : N

Point A (29.4MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	60.0	47.9
AV	50.0	38.6

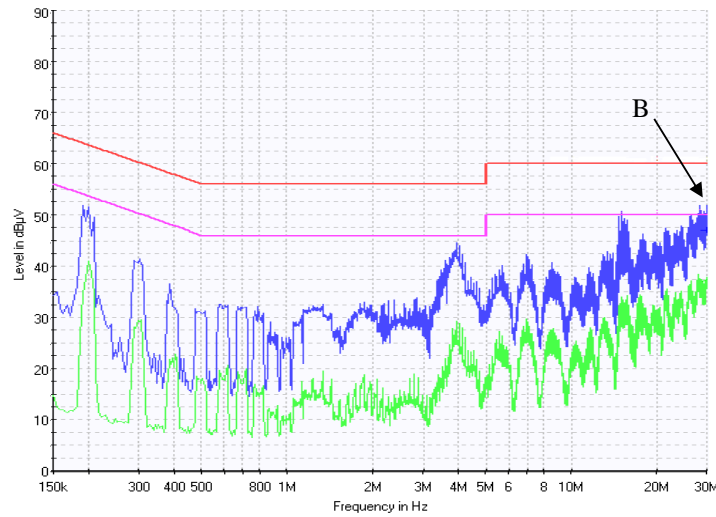


FCC Class B  
QP Limit

FCC Class B  
AV Limit

Phase : L

Point B (30MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	60.0	46.9
AV	50.0	37.5



FCC Class B  
QP Limit

FCC Class B  
AV Limit

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

CME100A

Conditions Vin : 230 VAC

Iout : Full load

Ta : 25 °C

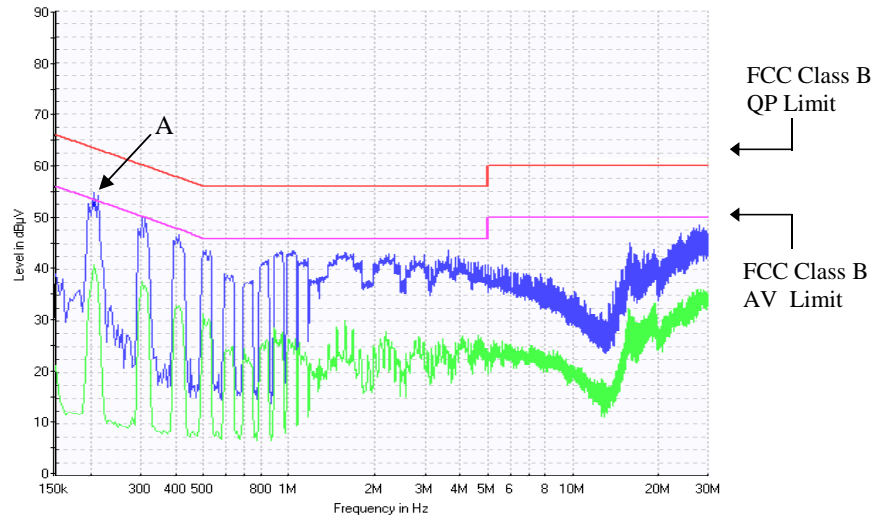
雑音端子電圧

Conducted Emission

12V

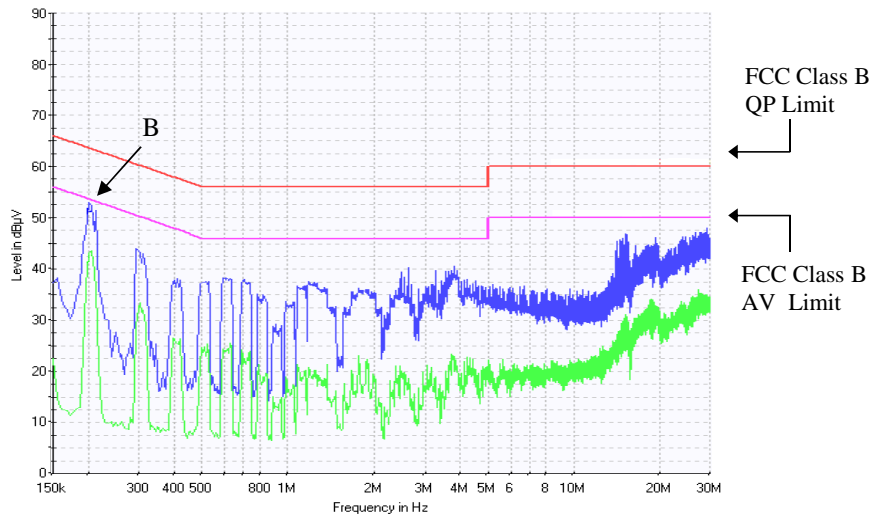
Phase : N

Point A (205KHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	63.0	52.4
AV	53.0	40.9



Phase : L

Point B (202KHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	63.0	50.7
AV	53.0	42.5



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

CME100A

Conditions Vin : 230 VAC

Iout : Full load

Ta : 25 °C

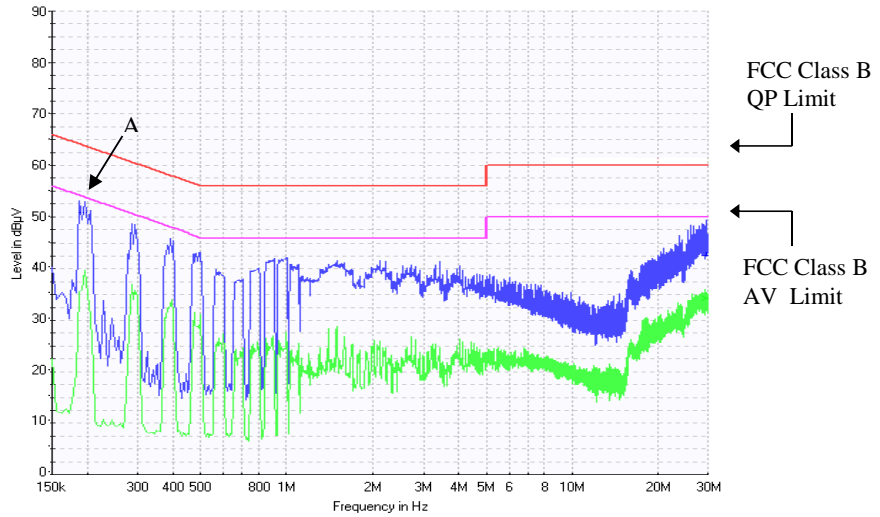
雑音端子電圧

Conducted Emission

24V

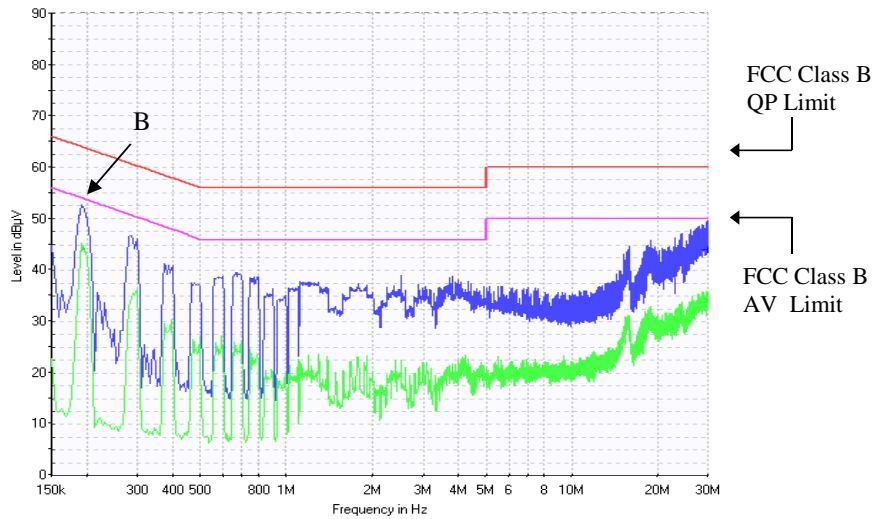
Phase : N

Point A (195KHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	63.0	50.8
AV	53.0	39.3



Phase : L

Point B (190KHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	63.0	50.3
AV	53.0	44.1



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

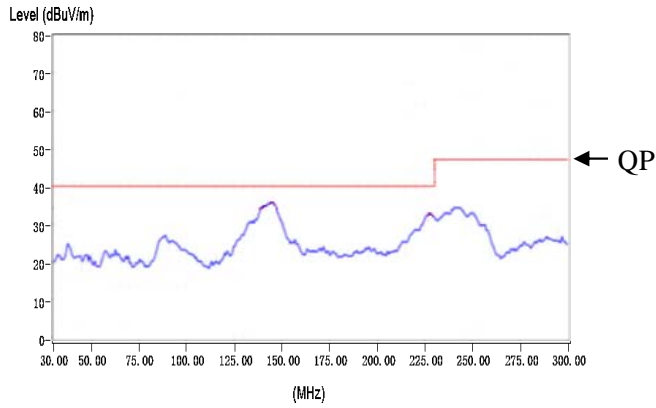
CME100A

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

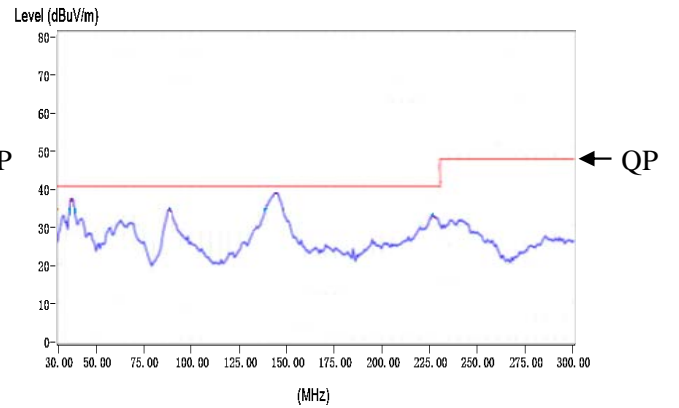
雑音電界強度  
Radiated Emission

**5V**

HORIZONTAL

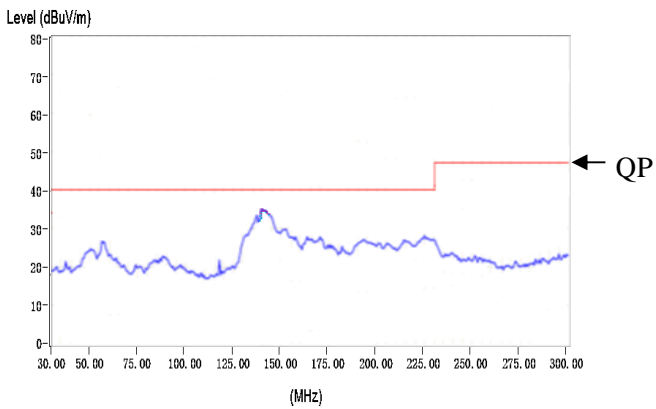


VERTICAL

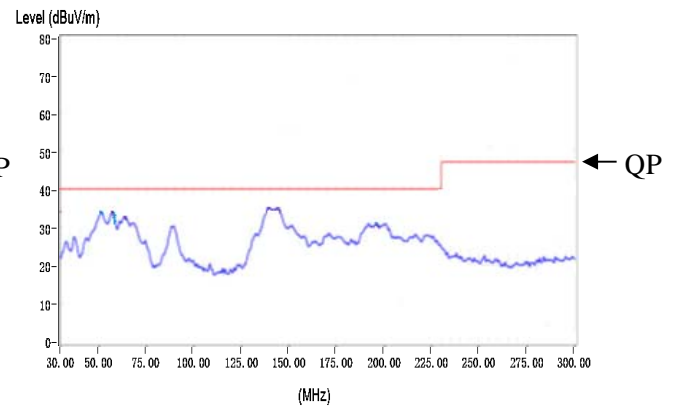


**12V**

HORIZONTAL

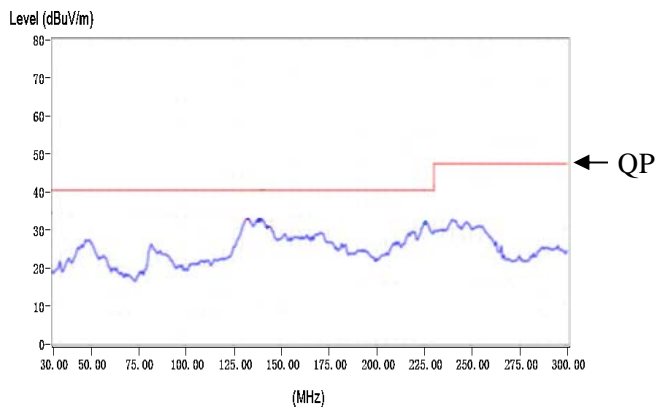


VERTICAL

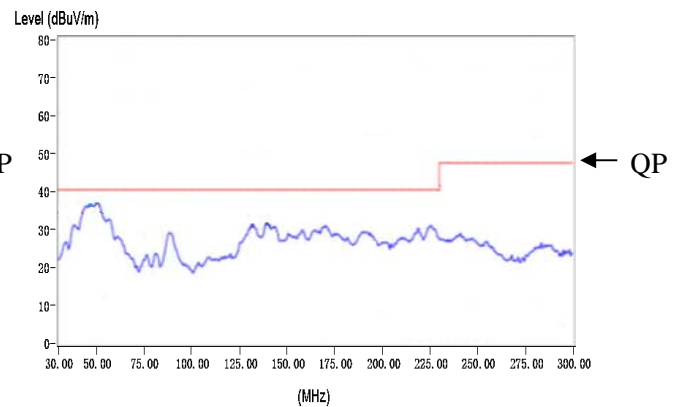


**24V**

HORIZONTAL



VERTICAL



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.