

# **CME800A**

# **EVALUATION DATA**

# 型式データ

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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
PG	..... パワーグッド信号 Power good signal
Vstb	..... スタンバイ電圧 Output voltage of standby
Istb	..... スタンバイ電流 Output current of standby

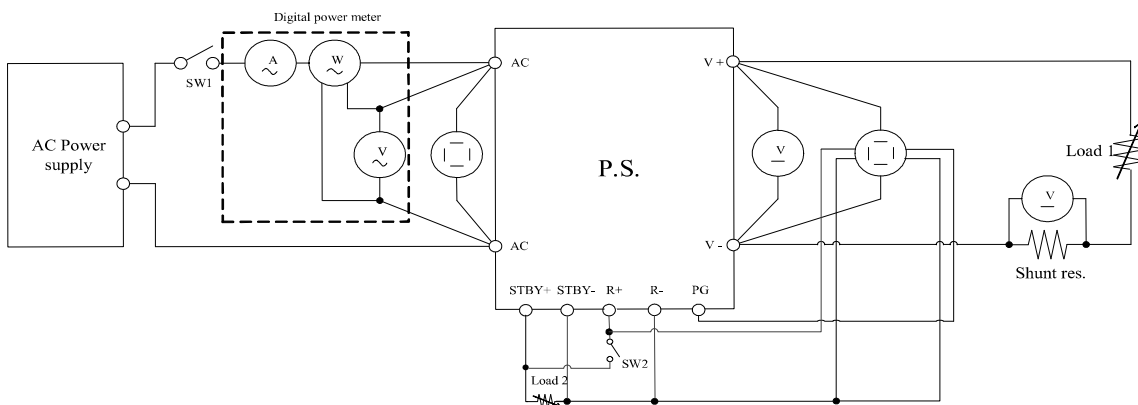
※ 当社測定条件における結果であり、参考値としてお考え願います。  
Test results are reference data based on our measurement condition.

## 1. 測定方法 Evaluation Method

### 1-1. 測定回路 Circuit used for determination

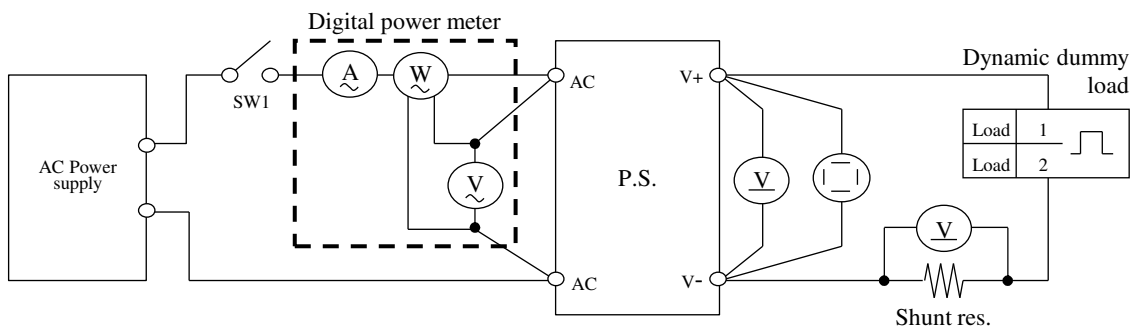
#### 測定回路1 Circuit 1 used for determination

- 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
- 出力電圧立ち上がり特性 Output rise characteristics
- 出力電圧立ち下がり特性 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
- 各種信号 Various signal

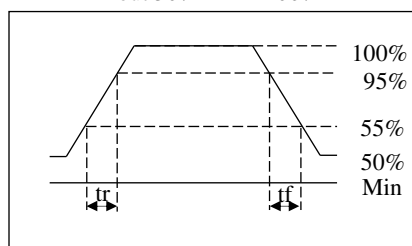


#### 測定回路2 Circuit 2 used for determination

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

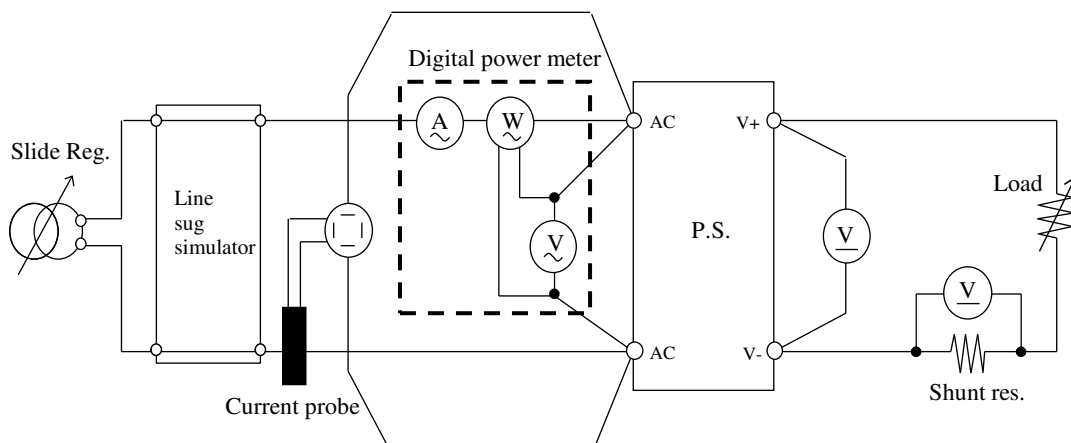


Output current waveform  
Iout 50% <==> 100%



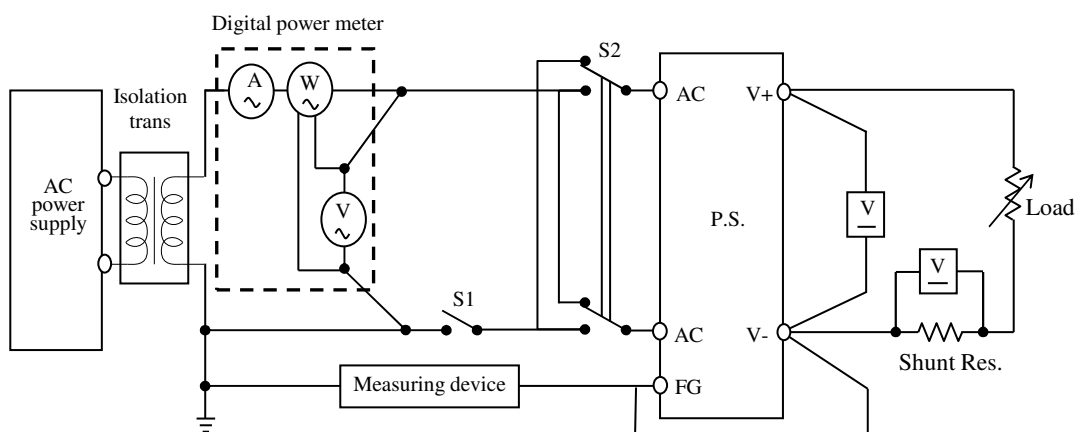
### 測定回路3 Circuit 3 used for determination

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



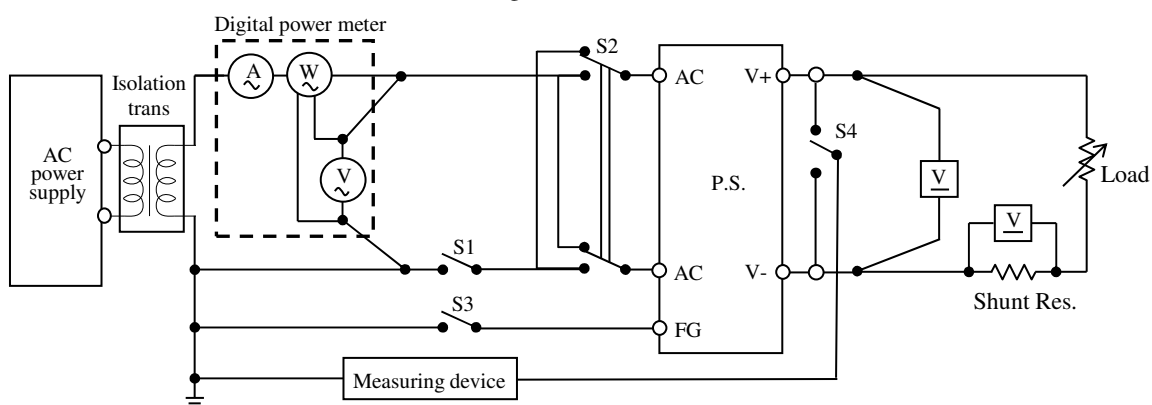
### 測定回路4 Circuit 4 used for determination

- ・接地漏洩電流特性 Earth leakage current characteristics



スイッチ:S2によりL/Nの相切り替えを行い、スイッチ:S1で通常状態/単一故障状態の切り替えを行います。  
Measure in all possible combination of position of S2 with :  
S1 closed (normal condition), and S1 open (single fault condition).

- ・患者漏洩電流特性 Patient leakage current



クラスI 機器向け CLASS I equipment:

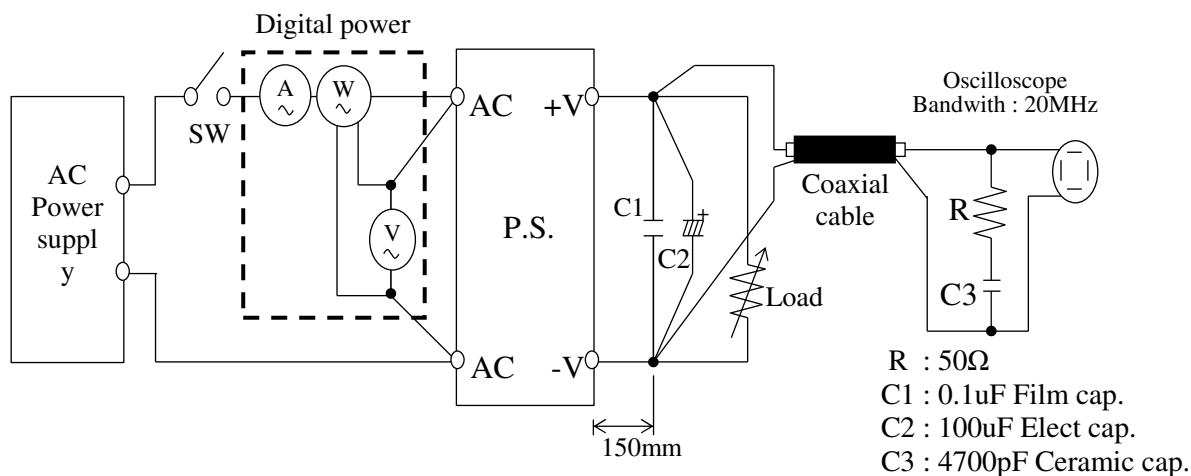
スイッチ:S1,S3を閉じて、スイッチ:S2,S4の接点箇所ので通常状態での漏洩電流測定を行います。  
スイッチ:S1もしくはS3のどちらかを開にすることで、単一故障状態へ切り替えを行います。

S1, S3 closed, measure under all possible position of S2 & S4.

Single fault condition: S1 open with S3 close or S1 close with S3 open.

測定回路5 Circuit 5 used for determination

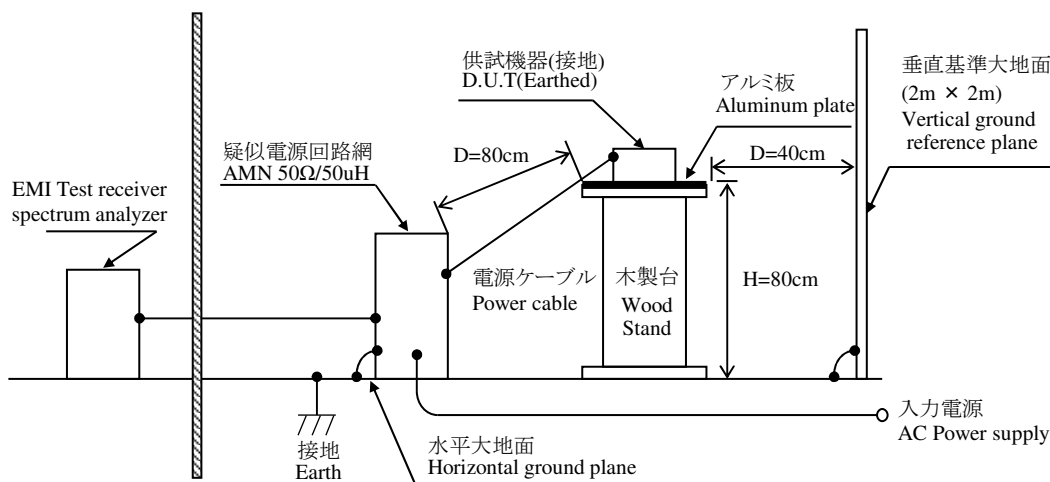
・出力リップル、ノイズ波形 Output ripple and noise waveform



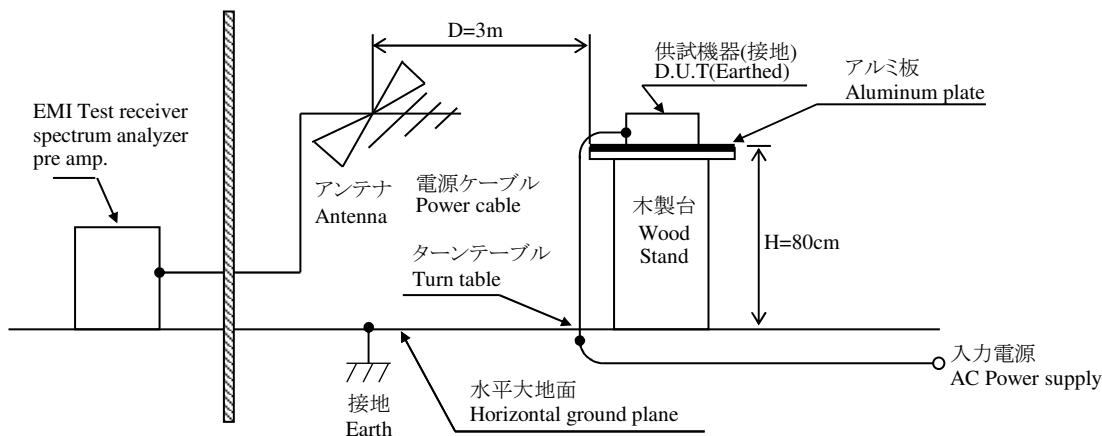
測定構成 Configuration used for determination

・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	KEYSIGHT	34970A
3	DIGITAL POWER METER	YOKOGAWA ELECT.	WT310
4	CURRENT PROBE	YOKOGAWA ELECT.	701930
5	POWER SUPPLY	YOKOGAWA ELECT.	701934
6	DYNAMIC DUMMY LOAD	CHROMA	63030/63203A/63640
7	AC SOURCE	KIKUSUI	PCR4000LE
8	EARTH LEAKAGE CURRENT METER	SIMPSON	228
9	PATIENT LEAKAGE CURRENT METER	SIQ	SIQ16042
10	CONTROLLED TEMP. CHAMBER	TABAI-ESPEC	SH-662
11	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESR3
12	LISN	ROHDE & SCHWARZ	ENV216
13	BROADBAND ANTENNA	SCHWARZBECK	VULB9163
14	LINE SUG SIMULATOR	TAKAMISAWA	PSA-210
15	SOUND CALIBRATOR	BRUEL AND KJAER	TYPE 4231
16	AUDIO ANALYZER	BRUEL AND KJAER	TYPE 3560-C

## 1-3. 評価負荷条件 Load conditions

V <sub>in</sub>	I <sub>out</sub>	12V	24V	36V	48V
85 - 265VAC	50%	28.35A	16.7A	11.1A	8.35A
85VAC	90%	51.03A	30.06A	19.98A	15.03A
90 - 265VAC	100%	56.7A	33.4A	22.2A	16.7A
85 - 265VAC	50%Peak	33.35A	-	-	-
85 - 265VAC	Peak	66.7A	-	-	-

\*V<sub>stb</sub>=5V, I<sub>stb</sub>=2A(100%)

## 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 : 100 % ( 56.7A )  
Istb : 0 %

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	Line regulation	
0%	12.028V	12.025V	12.025V	12.024V	4mV	0.033%
50%	12.010V	12.010V	12.010V	12.009V	1mV	0.008%
100%	-	11.996V	11.996V	11.996V	0mV	0.000%
Peak	-	11.976V	11.976V	11.976V	0mV	0.000%
Load	18mV	29mV	29mV	28mV		
regulation	0.150%	0.242%	0.242%	0.233%		

#### 2. Temperature drift

Condition Vin : 115 VAC  
Iout : 100 % ( 56.7A )  
Istb : 0 %

Ta	-20°C	+25°C	+55°C	Temperature stability	
Vout	11.987V	11.996V	11.996V	9mV	0.075%

#### 3. Start up voltage and Drop out voltage

Condition Ta : 25 °C  
Iout : Peak ( 66.7A )  
Istb : 0 %

Start up voltage (Vin)	79.2VAC
Drop out voltage (Vin)	77.8VAC

24V

#### 1. Regulation - line and load

Condition Ta : 25 °C  
Iout : 100 % ( 33.4A )  
Istb : 0 %

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	Line regulation	
0%	24.048V	24.045V	24.046V	24.044V	4mV	0.017%
50%	24.025V	24.024V	24.025V	24.024V	1mV	0.004%
100%	-	24.017V	24.017V	24.016V	1mV	0.004%
Load	23mV	28mV	29mV	28mV		
regulation	0.096%	0.117%	0.121%	0.117%		

#### 2. Temperature drift

Condition Vin : 115 VAC  
Iout : 100 % ( 33.4A )  
Istb : 0 %

Ta	-20°C	+25°C	+55°C	Temperature stability	
Vout	23.985V	24.017V	24.022V	37mV	0.154%

#### 3. Start up voltage and Drop out voltage

Condition Ta : 25 °C  
Iout : 100 % ( 33.4A )  
Istb : 0 %

Start up voltage (Vin)	79.1VAC
Drop out voltage (Vin)	78.0VAC



## (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

36V

## 1. Regulation - line and load

Condition Ta : 25 °C

Iout : 100 % ( 22.2A )

Istb : 0 %

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	Line regulation	
0%	36.084V	36.085V	36.052V	36.080V	33mV	0.092%
50%	36.045V	36.045V	36.045V	36.045V	0mV	0.000%
100%	-	36.037V	36.037V	36.037V	0mV	0.000%
Load	39mV	48mV	15mV	43mV		
regulation	0.108%	0.133%	0.042%	0.119%		

## 2. Temperature drift

Condition Vin : 115 VAC

Iout : 100 % ( 22.2A )

Istb : 0 %

Ta	-20°C	+25°C	+55°C	Temperature stability	
Vout	36.002V	36.037V	36.036V	35mV	0.097%

## 3. Start up voltage and Drop out voltage

Conc Ta : 25 °C

Iout : 100 % ( 22.2A )

Istb : 0 %

Start up voltage (Vin)	78.7VAC
Drop out voltage (Vin)	77.8VAC

48V

## 1. Regulation - line and load

Condition Ta : 25 °C

Iout : 100 % ( 16.7A )

Istb : 0 %

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	Line regulation	
0%	48.081V	48.094V	48.094V	48.082V	13mV	0.027%
50%	0:56	48.039V	48.039V	48.038V	1mV	0.002%
100%	-	48.032V	48.032V	48.032V	0mV	0.000%
Load	42mV	62mV	62mV	50mV		
regulation	0.088%	0.129%	0.129%	0.104%		

## 2. Temperature drift

Condition Vin : 115 VAC

Iout : 100 % ( 16.7A )

Istb : 0 %

Ta	-20°C	+25°C	+55°C	Temperature stability	
Vout	47.976V	48.032V	48.044V	68mV	0.142%

## 3. Start up voltage and Drop out voltage

Condition Ta : 25 °C

Iout : 100 % ( 16.7A )

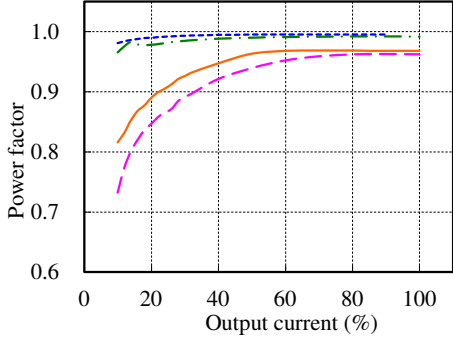
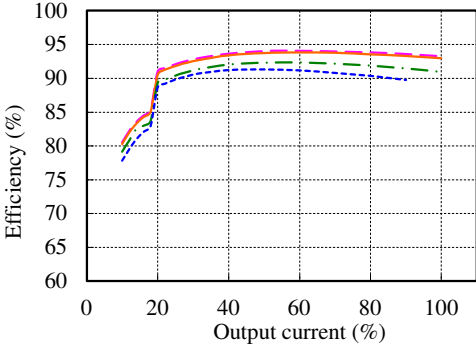
Istb : 0 %

Start up voltage (Vin)	79.4VAC
Drop out voltage (Vin)	78.3VAC

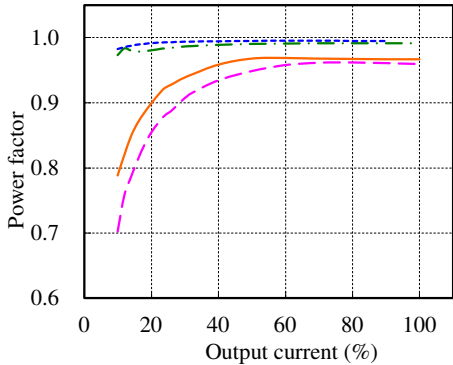
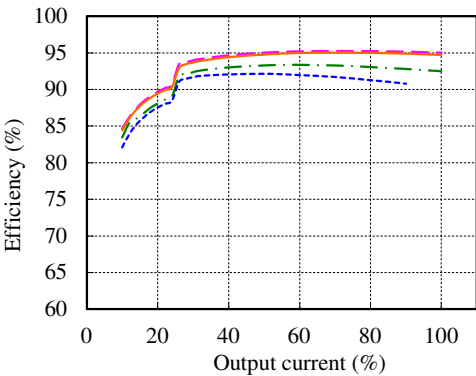
(2) 効率・力率対出力電流  
Efficiency and Power factor vs. Output current

Conditions Vin : 85 VAC ---  
115 VAC - - -  
230 VAC ———  
265 VAC - · - · -  
Ta : 25 °C  
Istb : 0 %

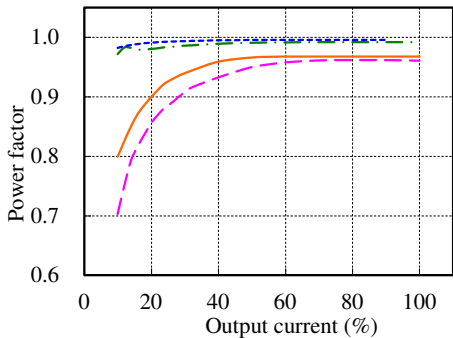
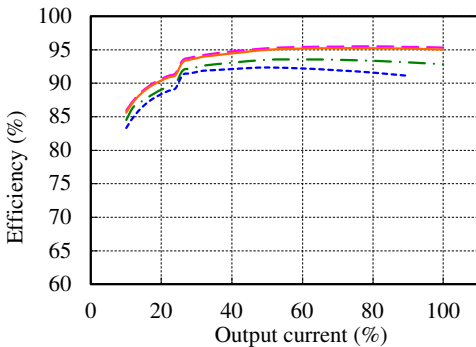
12V



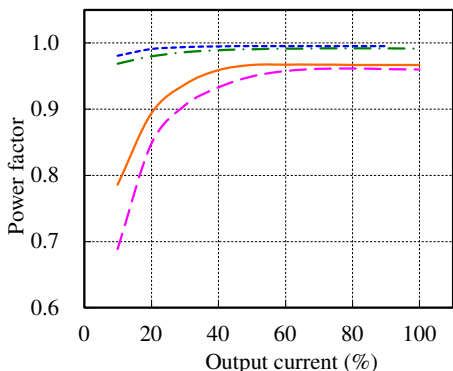
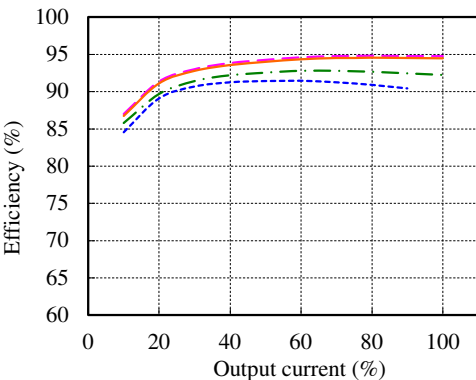
24V



36V



48V

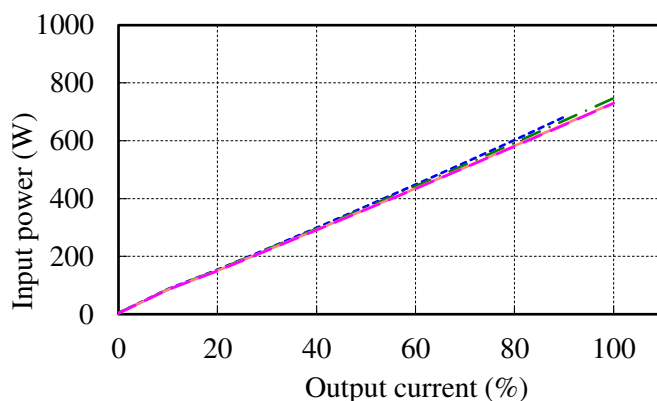


(3) 入力電力対出力電流  
Input power vs. Output current

Conditions Vin : 85 VAC ---  
115 VAC - - -  
230 VAC ———  
265 VAC - · - ·  
Ta : 25 °C  
Istb : 0 %

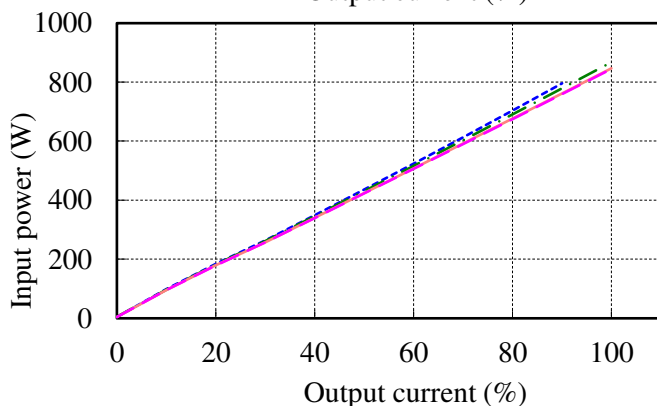
12V

Vin	Input power	
	Iout : 0%	Remote OFF
85VAC	4.4W	0.30W
115VAC	4.4W	0.34W
230VAC	3.2W	0.60W
265VAC	3.5W	0.72W



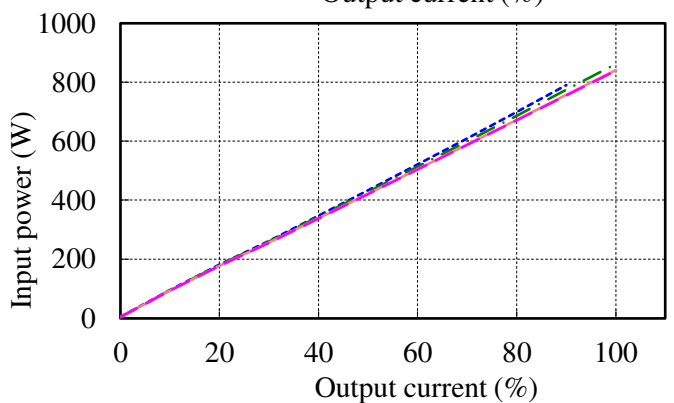
24V

Vin	Input power	
	Iout : 0%	Remote OFF
85VAC	4.7W	0.30W
115VAC	5.0W	0.34W
230VAC	3.9W	0.60W
265VAC	3.9W	0.72W



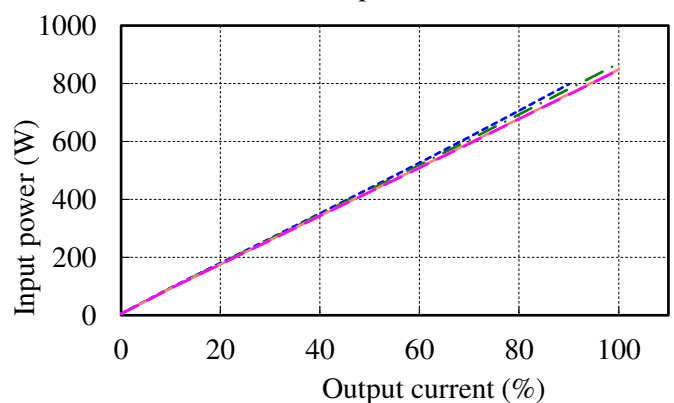
36V

Vin	Input power	
	Iout : 0%	Remote OFF
85VAC	5.0W	0.31W
115VAC	5.4W	0.34W
230VAC	4.0W	0.61W
265VAC	4.0W	0.73W



48V

Vin	Input power	
	Iout : 0%	Remote OFF
85VAC	5.6W	0.30W
115VAC	5.8W	0.34W
230VAC	4.4W	0.60W
265VAC	4.4W	0.72W

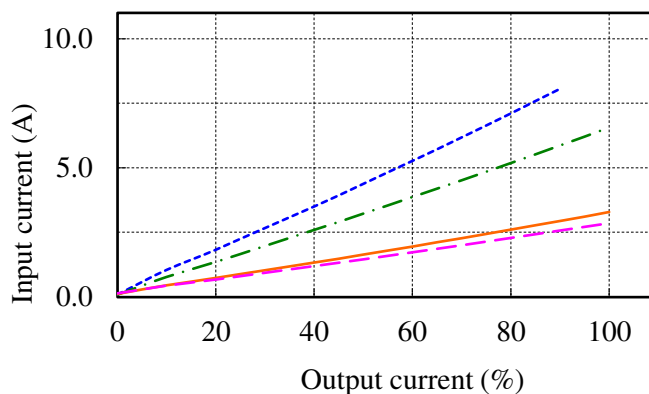


(4) 入力電流対出力電流  
Input current vs. Output current

Conditions Vin : 85 VAC ---  
115 VAC - - -  
230 VAC ———  
265 VAC - · - · -  
Ta : 25 °C  
Istb : 0 %

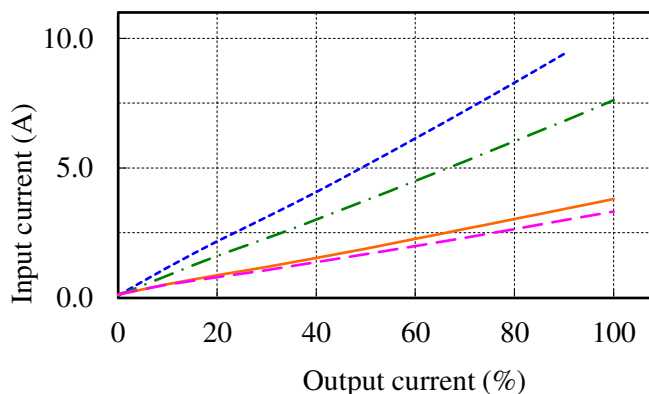
12V

Vin	Input current	
	Iout : 0%	Remote OFF
85VAC	0.09A	0.04A
115VAC	0.09A	0.05A
230VAC	0.12A	0.11A
265VAC	0.14A	0.12A



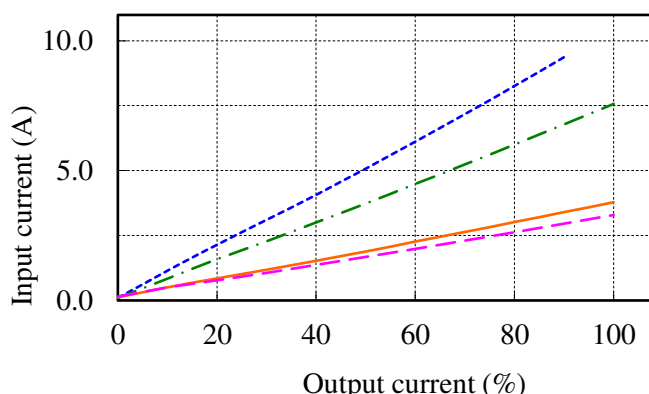
24V

Vin	Input current	
	Iout : 0%	Remote OFF
85VAC	0.10A	0.04A
115VAC	0.10A	0.05A
230VAC	0.12A	0.11A
265VAC	0.15A	0.12A



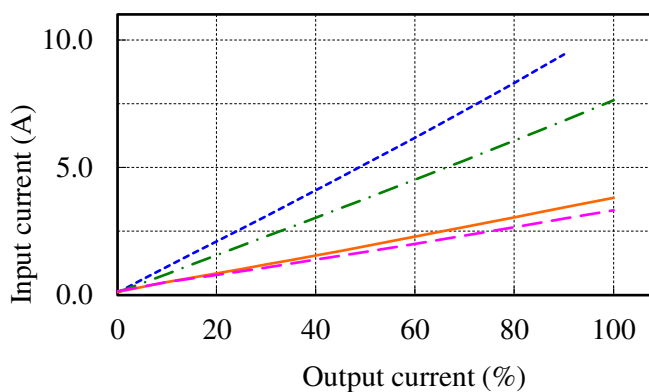
36V

Vin	Input current	
	Iout : 0%	Remote OFF
85VAC	0.10A	0.04A
115VAC	0.10A	0.05A
230VAC	0.12A	0.11A
265VAC	0.15A	0.12A



48V

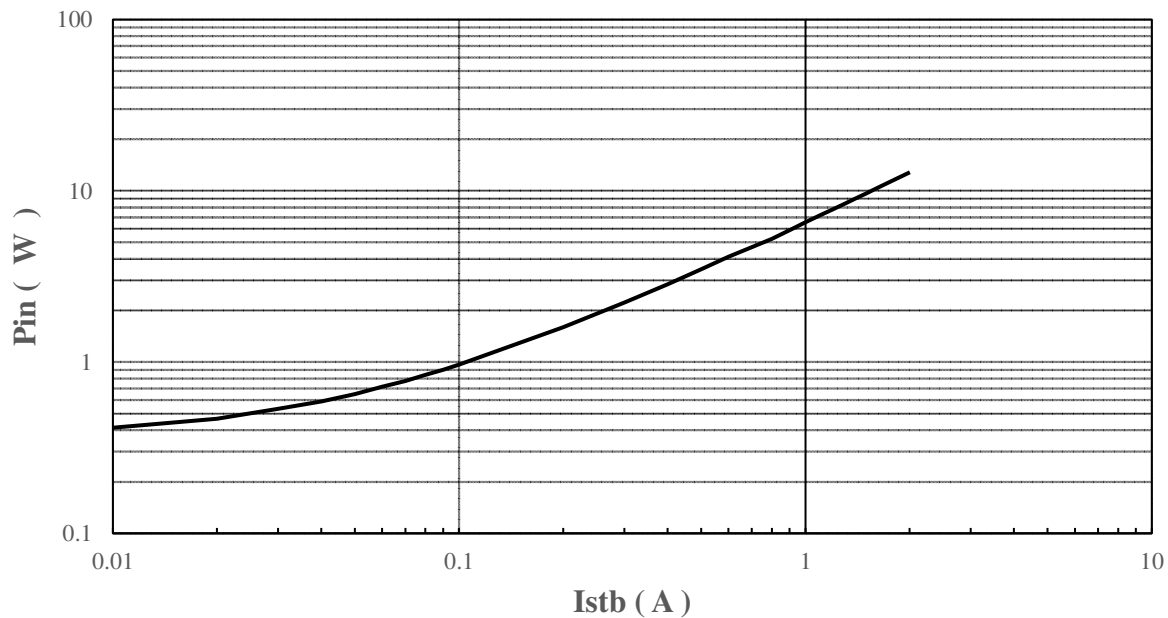
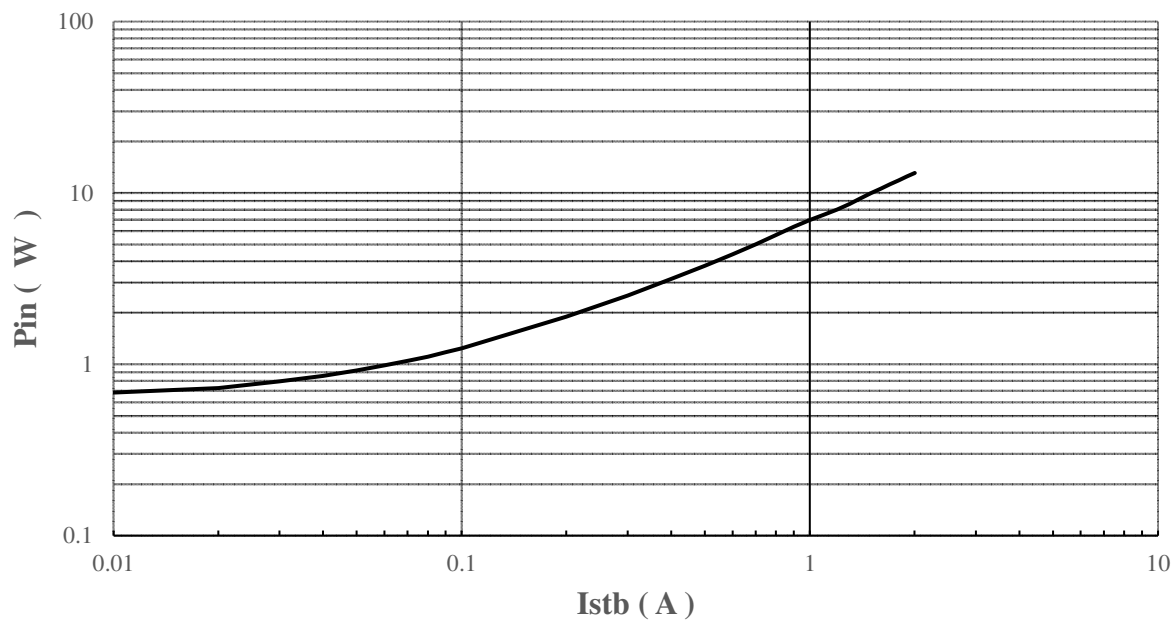
Vin	Input current	
	Iout : 0%	Remote OFF
85VAC	0.11A	0.04A
115VAC	0.11A	0.05A
230VAC	0.13A	0.11A
265VAC	0.15A	0.12A



## (5) リモートOFF時入力電力対出力電流 (Istb)

Input power vs. Output current @ Remote OFF

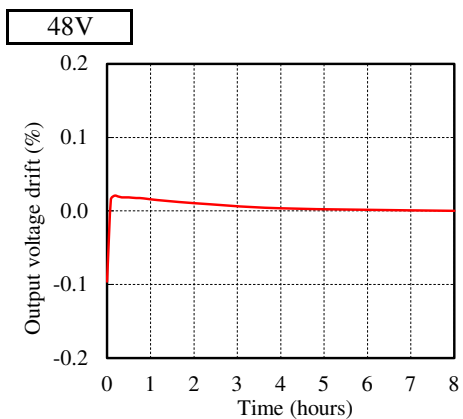
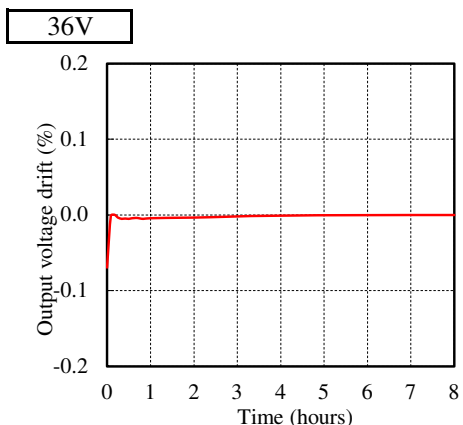
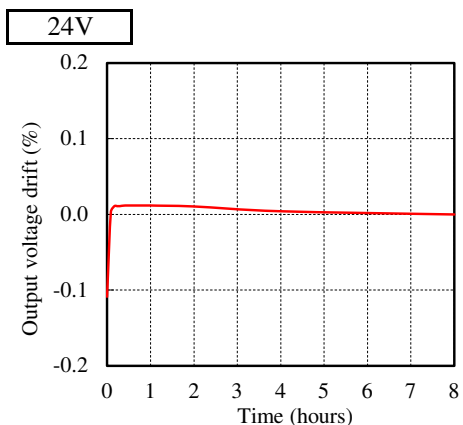
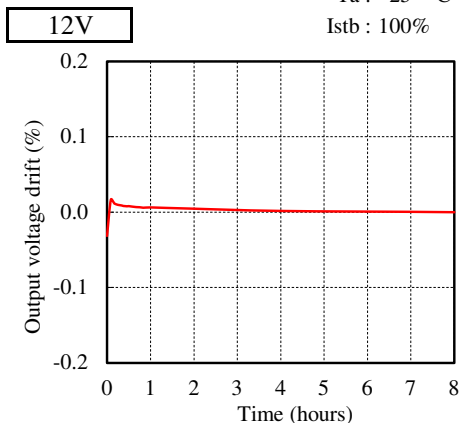
Condition : Remote OFF

**Istb Vs Pin @ 115VAC****Istb Vs Pin @ 230VAC**

2-2. 通電ドリフト特性

Warm up voltage drift characteristics

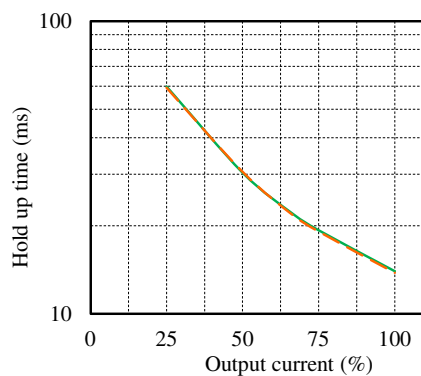
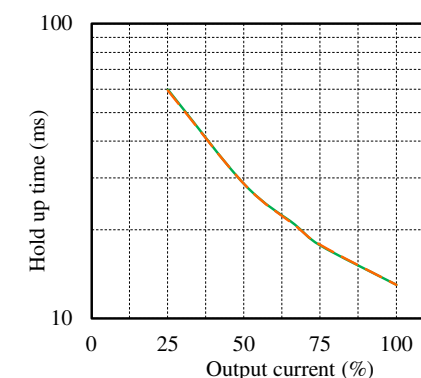
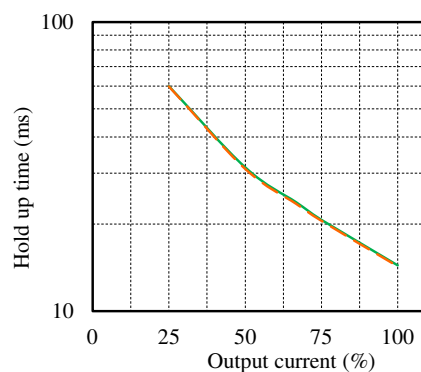
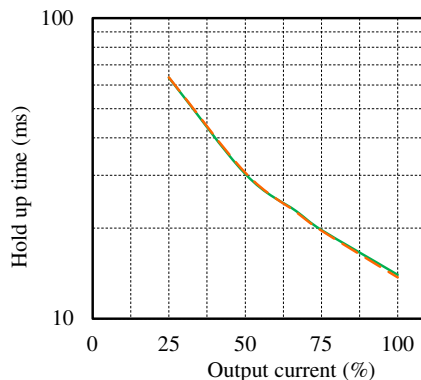
Conditions Vin : 115 VAC  
 Iout : 100 %  
 Ta : 25 °C  
 Istb : 100%



2-3. 保持時間特性

Hold up time characteristics

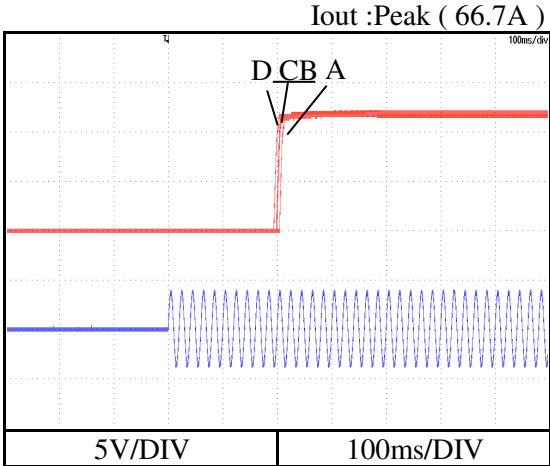
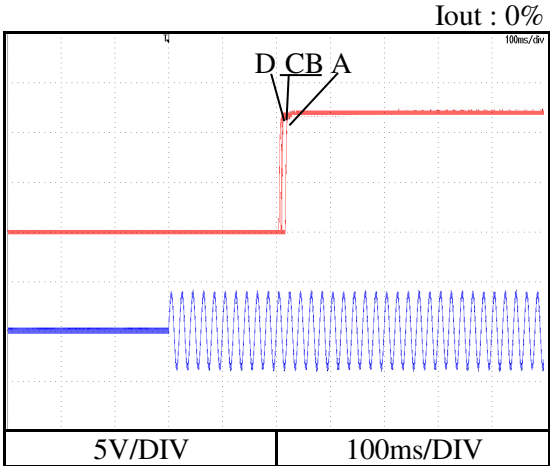
Conditions Vin : 115 VAC  
 230 VAC  
 Ta : 25 °C  
 Istb : 100%



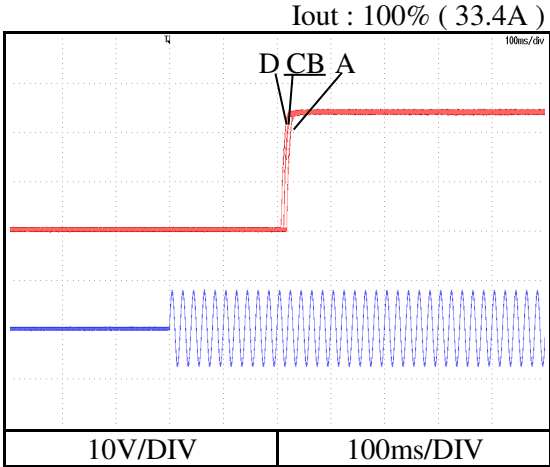
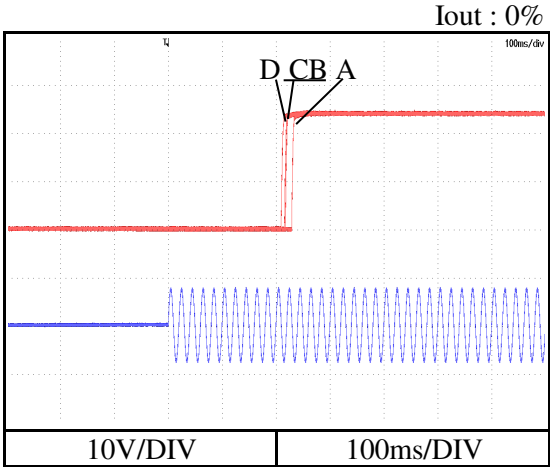
2-4. 出力立ち上がり特性  
Output rise characteristics

Conditions Vin : 85 VAC (A)  
115 VAC (B)  
230 VAC (C)  
265 VAC (D)  
Istb : 100 %  
Ta : 25 °C

12V



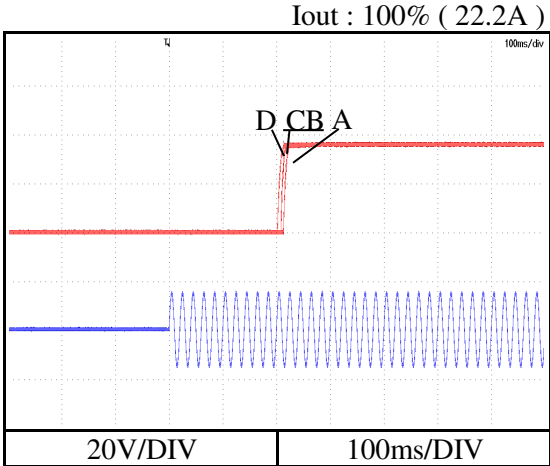
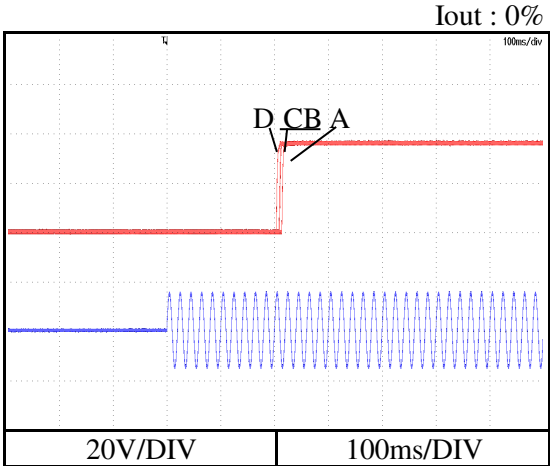
24V



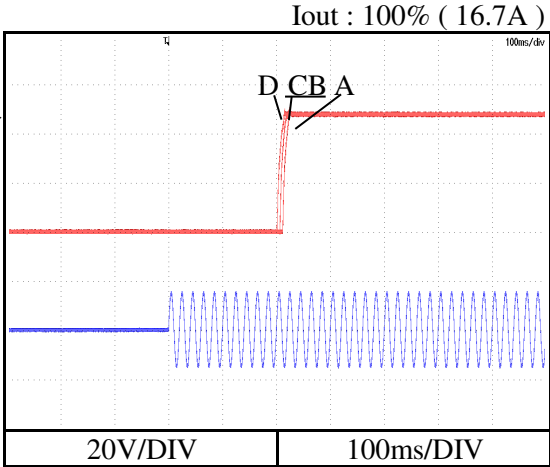
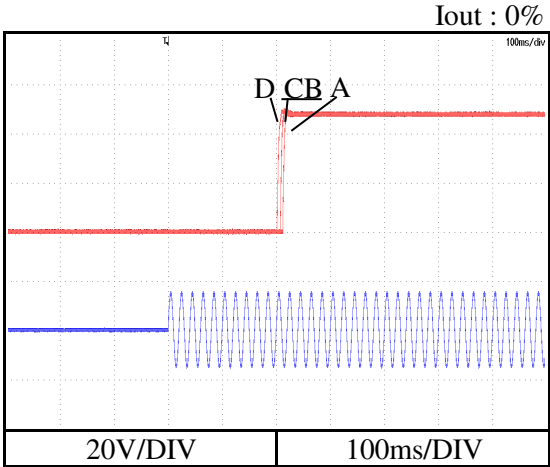
2-4. 出力立ち上がり特性  
Output rise characteristics

Conditions Vin : 85 VAC (A)  
115 VAC (B)  
230 VAC (C)  
265 VAC (D)  
Istb : 100 %  
Ta : 25 °C

36V



48V

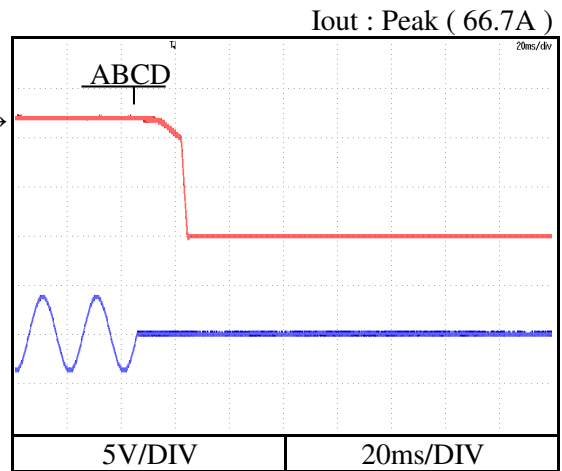
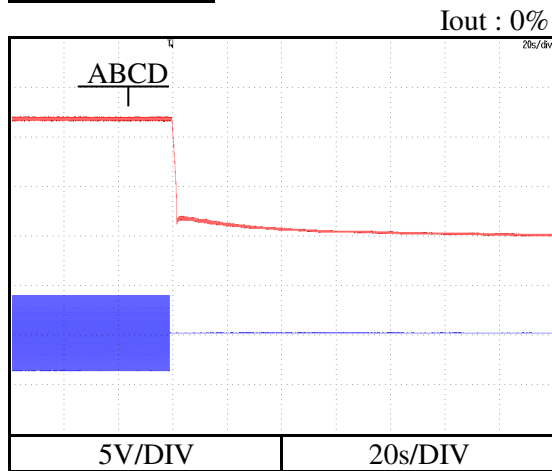




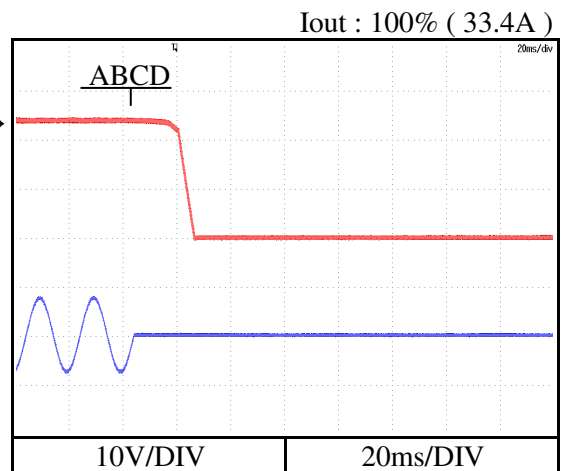
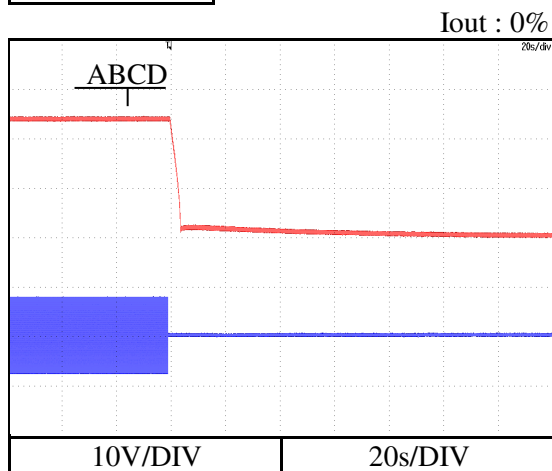
2-5. 出力立ち下がり特性  
Output fall characteristics

Conditions Vin : 85 VAC (A)  
115 VAC (B)  
230 VAC (C)  
265 VAC (D)  
Istb : 100 %  
Ta : 25 °C

12V



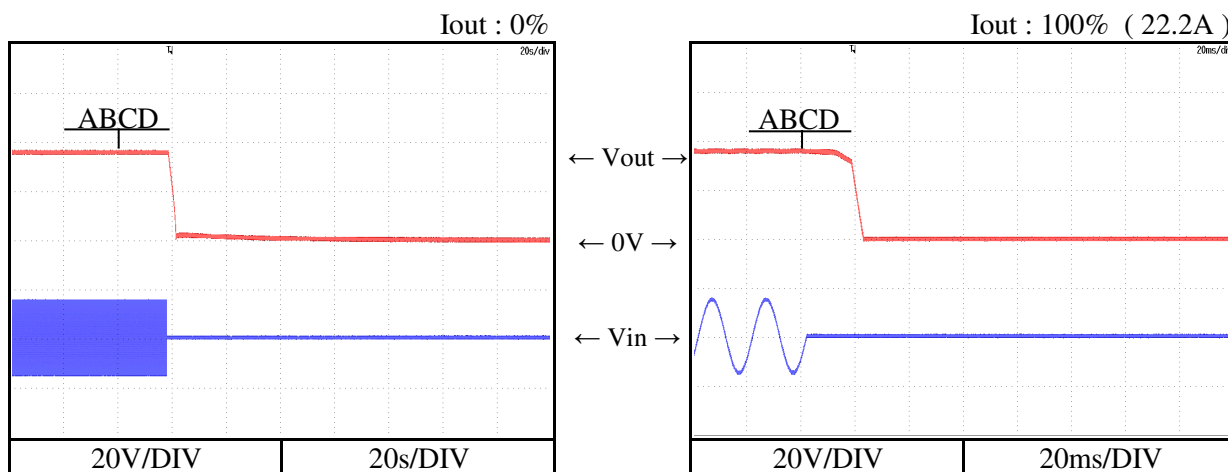
24V



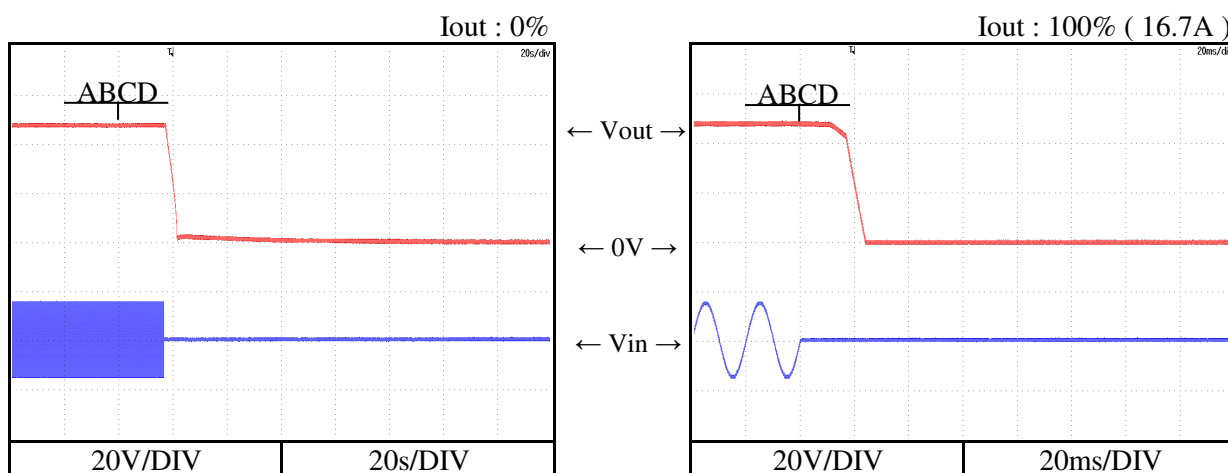
2-5. 出力立ち下がり特性  
Output fall characteristics

Conditions Vin : 85 VAC (A)  
115 VAC (B)  
230 VAC (C)  
265 VAC (D)  
Istb : 100 %  
Ta : 25 °C

36V



48V



2-6. 各種信号

Various signal

Conditions Vin : 115 VAC

Iout : 100 %

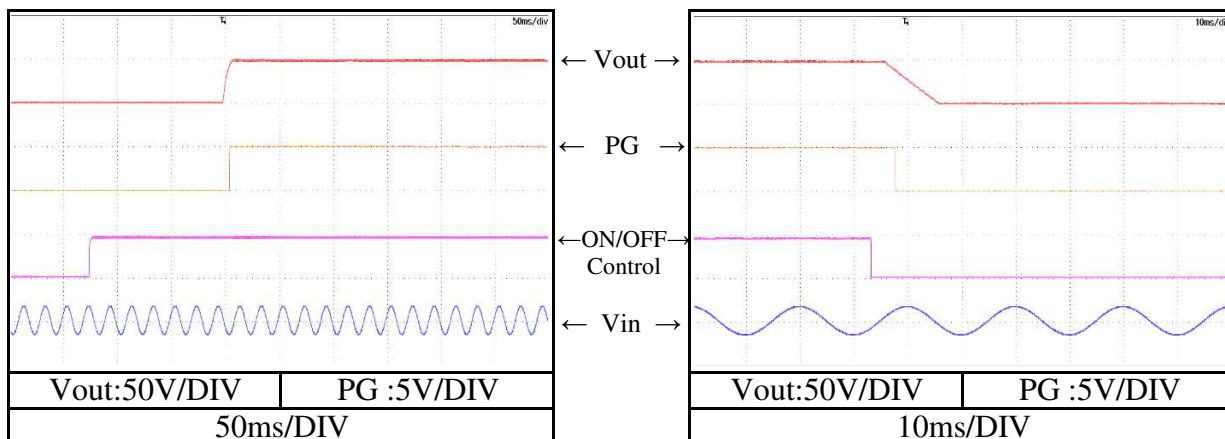
Istb : 100 %

Ta : 25 °C

リモートON/OFFコントロールによる出力電圧立ち上がり、立ち下がり特性

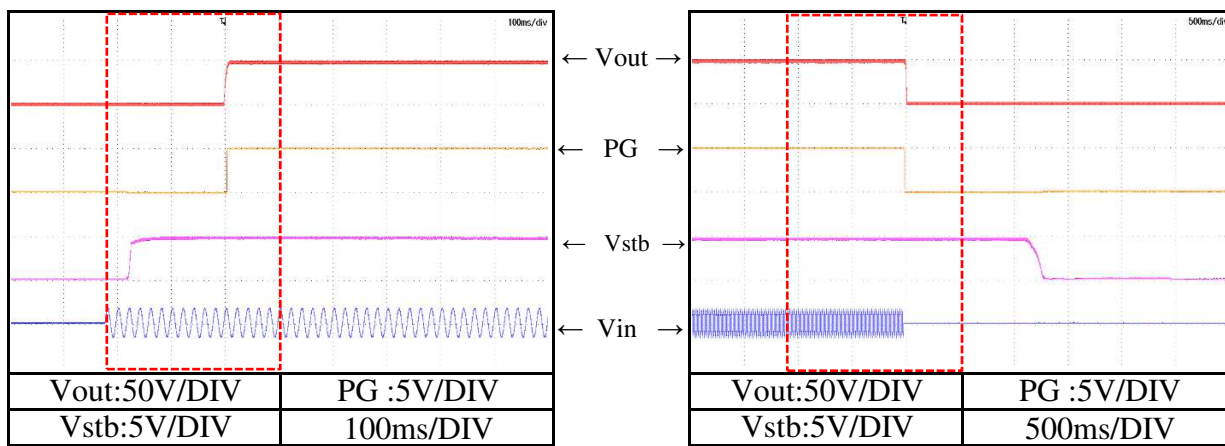
Output rise, fall characteristics with Remote ON/OFF Control

48V



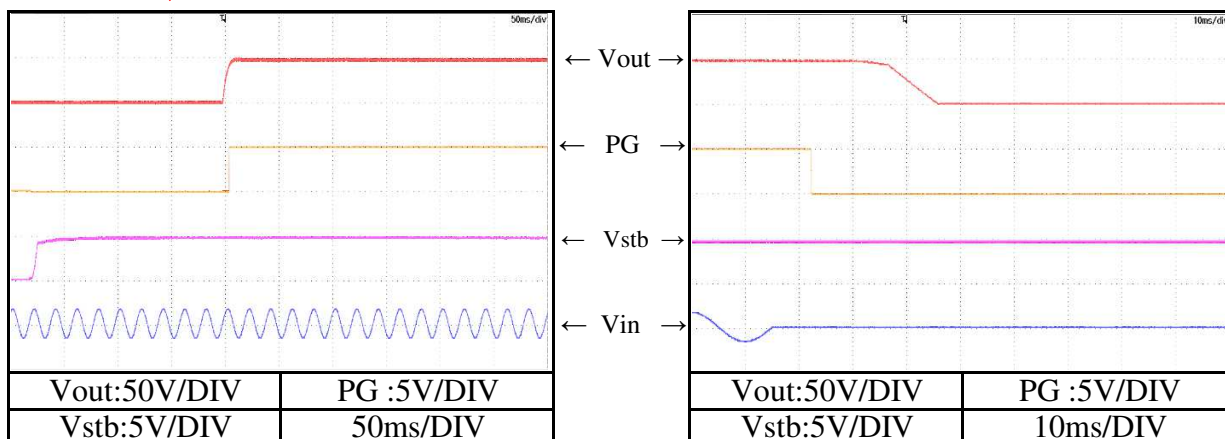
入力電圧ON/OFFによる出力立ち上がり、立ち下がり特性

Output rise, fall characteristics with Input voltage ON/OFF



Zoom

Zoom

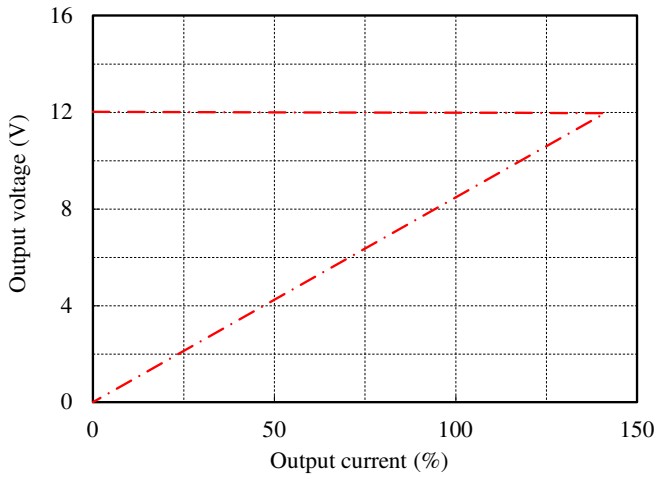


2-7. 過電流保護特性

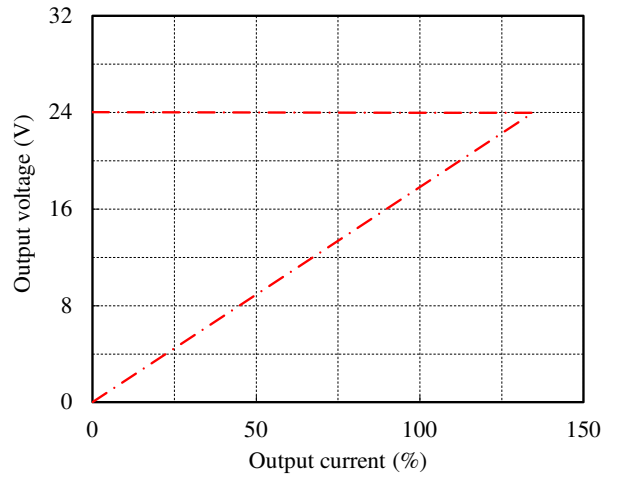
Over current protection (OCP) characteristics

Conditions Vin : 115 VAC  
 Istb : 100 %  
 Ta : 25 °C

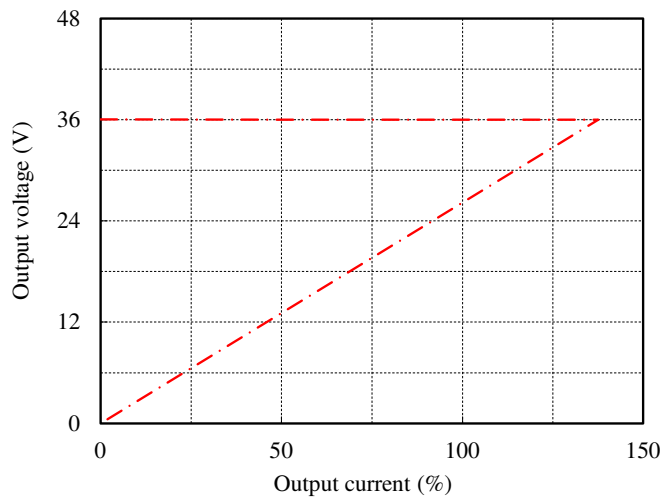
12V



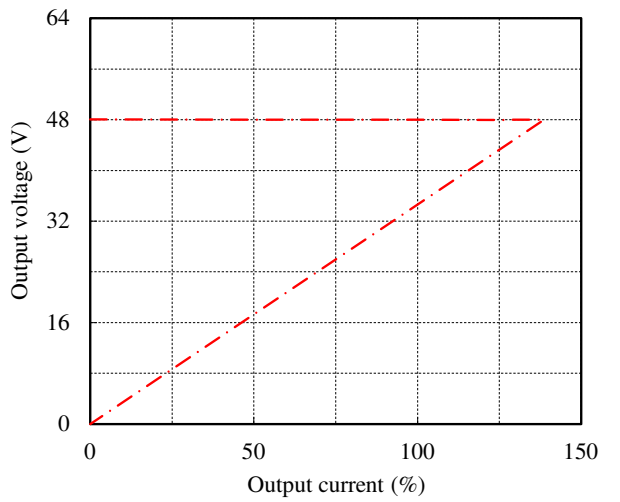
24V



36V



48V

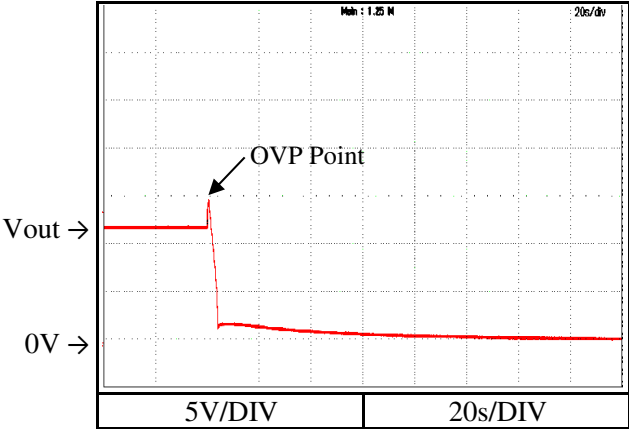


2-8. 過電圧保護特性

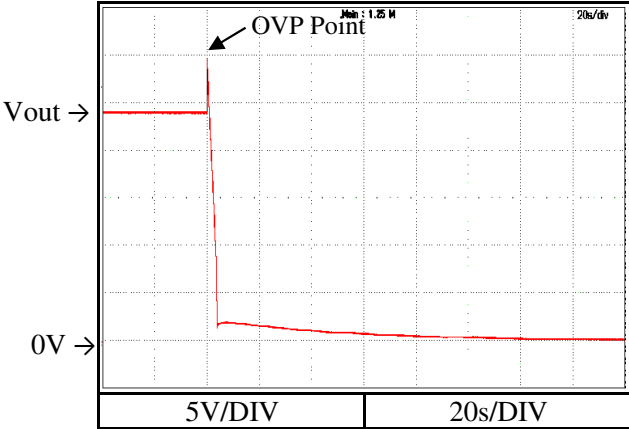
Over voltage protection (OVP) characteristics

Conditions Vin : 115 VAC  
Iout : 0 %  
Istb : 0 %  
Ta : 25 °C

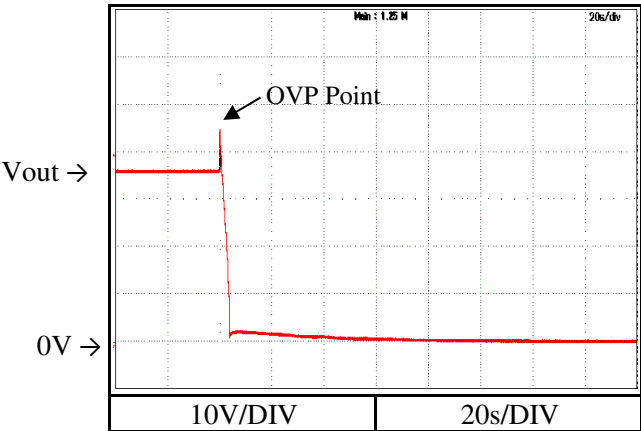
12V



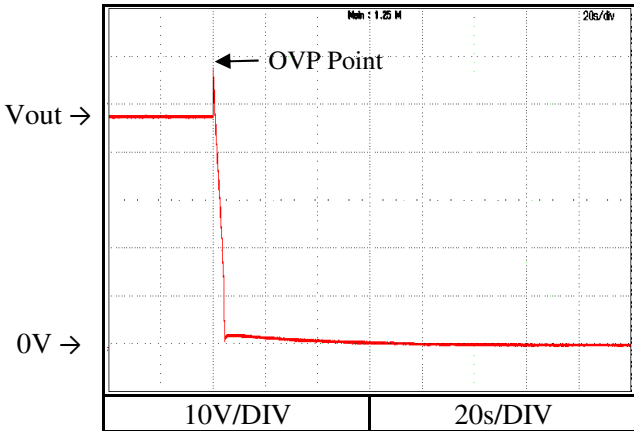
24V



36V



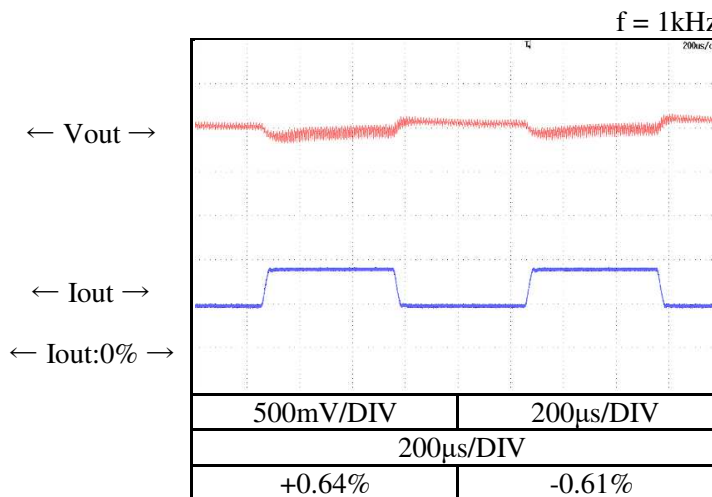
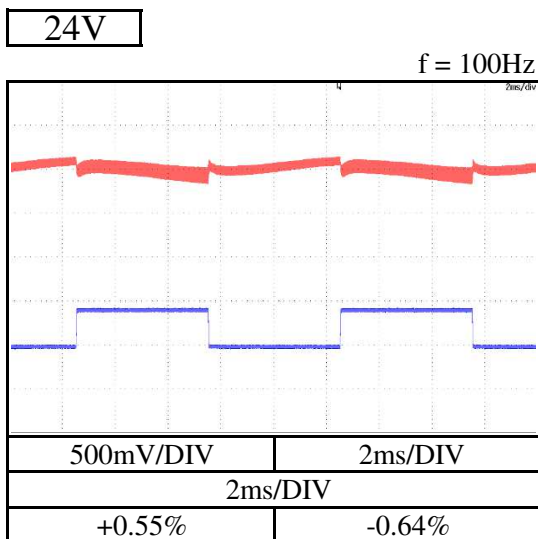
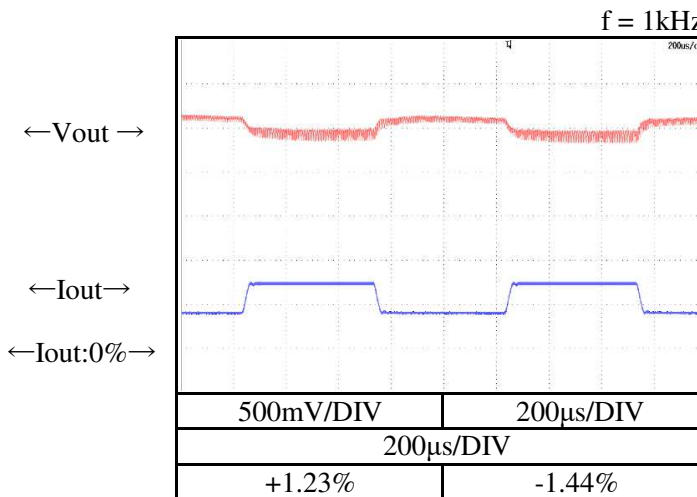
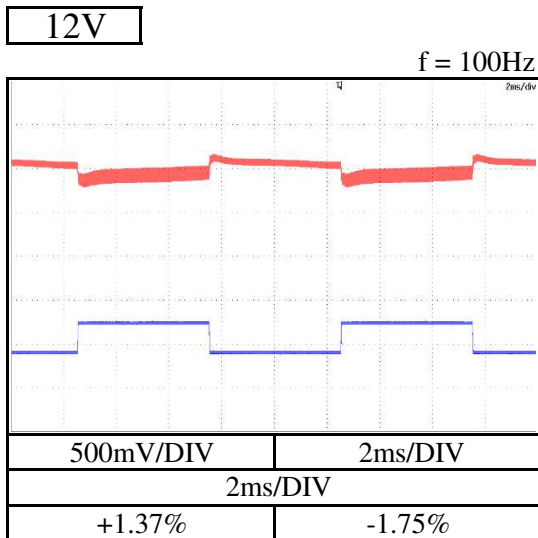
48V



2-9. 過渡応答(負荷急変)特性

Dynamic load response characteristics

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



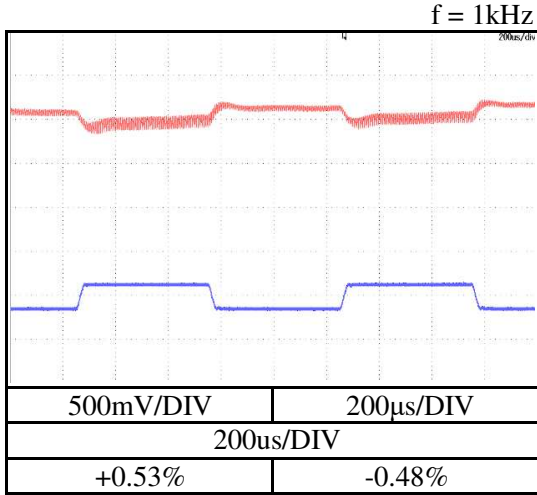
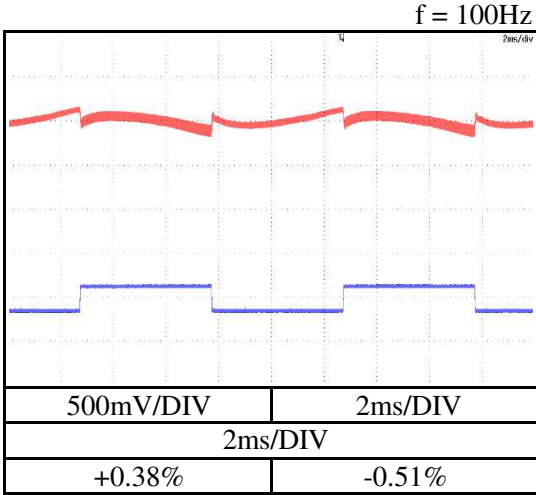
Conditions Vin : 115 VAC  
 Iout : 50 % ↔ 100 %  
 (tr = tf = 50us)  
 Istb : 100 %  
 Ta : 25 °C

2-9. 過渡応答(負荷急変)特性

Dynamic load response characteristics

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

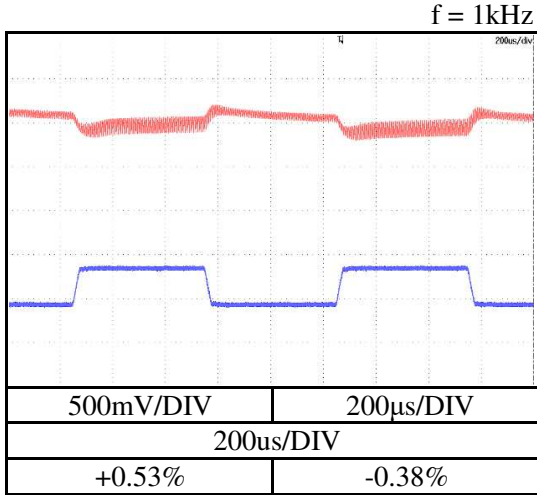
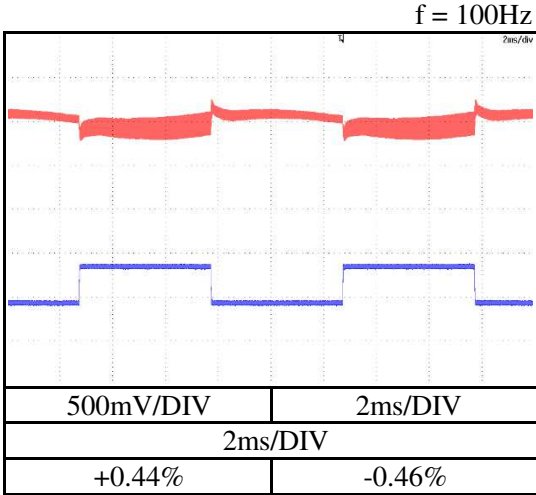
36V



←Vout→  
← Iout →  
← Iout:0% →

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

48V



←Vout→  
← Iout →  
← Iout:0% →

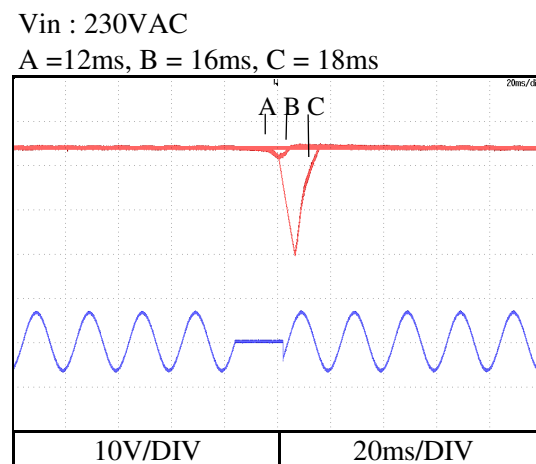
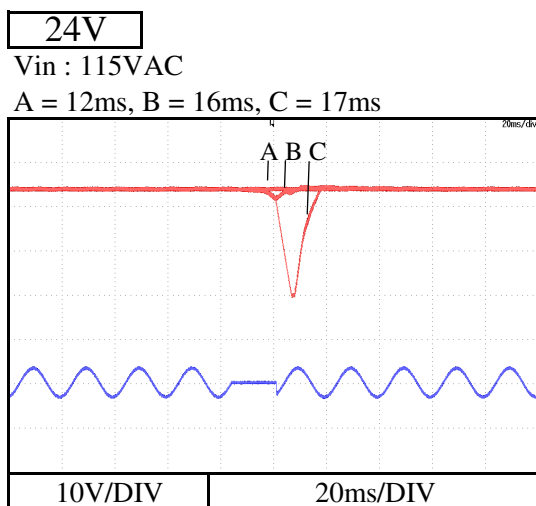
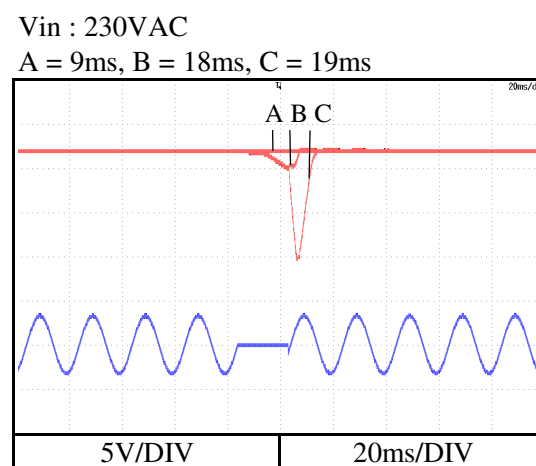
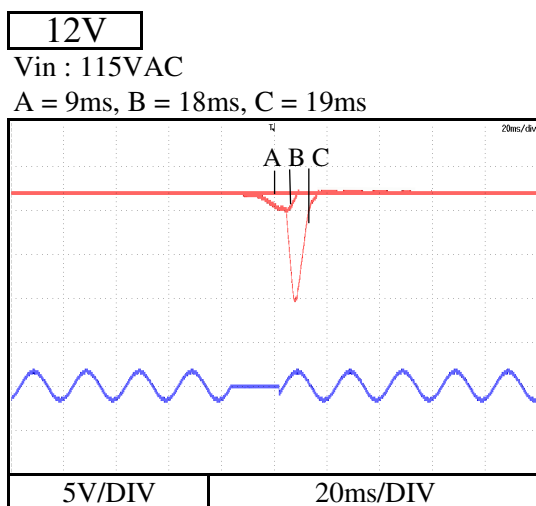
2-10. 入力電圧瞬停特性

Response to brown out characteristics

Conditions      Iout : 100 %  
                      Istb : 100 %  
                      Ta : 25 °C

瞬停時間 Interruption time

- A : 出力電圧の低下なし Output voltage does not drop.
- B : 出力電圧の低下が定格出力電圧の20~40%までいかない  
       Output voltage drop down to 20~40% of the nominal output voltage.
- C : 出力電圧が0Vまで低下 Output voltage drops until 0V.





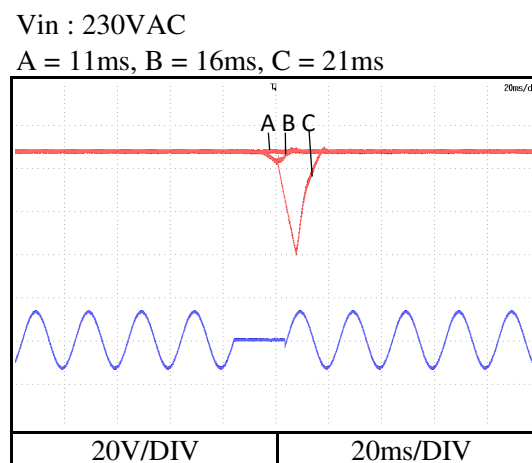
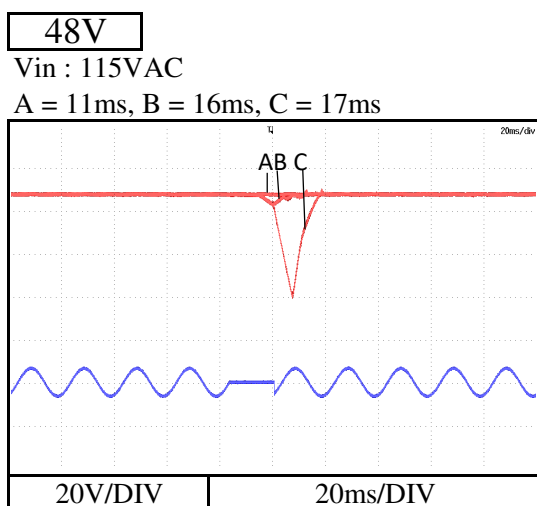
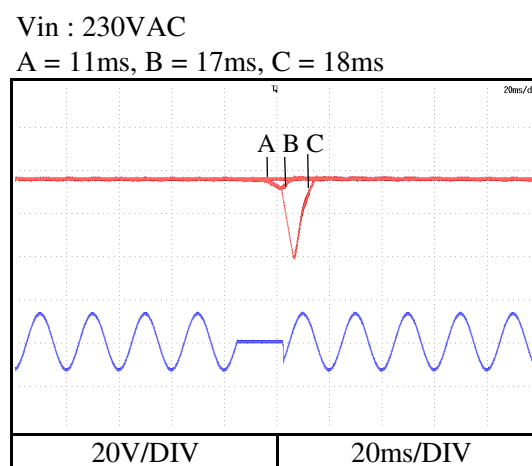
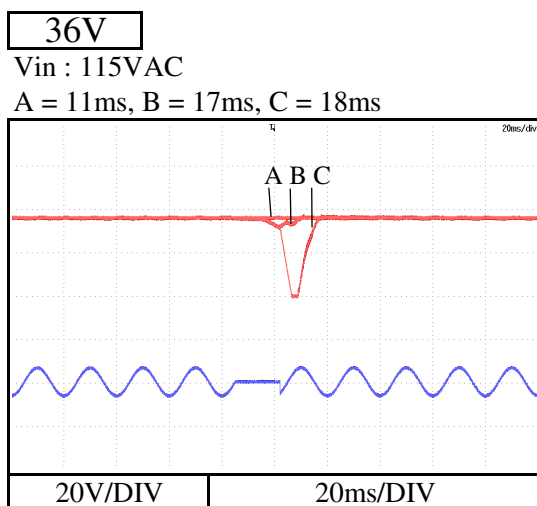
2-10. 入力電圧瞬停特性

Response to brown out characteristics

Conditions      Iout : 100 %  
                      Istb : 100 %  
                      Ta : 25 °C

瞬停時間 Interruption time

- A : 出力電圧の低下なし Output voltage does not drop.
- B : 出力電圧の低下が定格出力電圧の20~40%までいかない  
       Output voltage drop down to 20~40% of the nominal output voltage.
- C : 出力電圧が0Vまで低下 Output voltage drops until 0V.

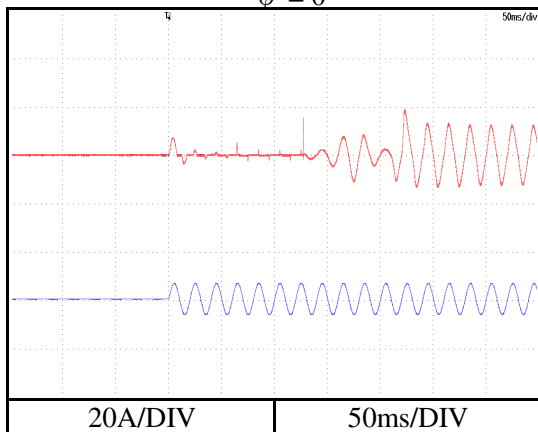


2-11. 入力サージ電流(突入電流)波形  
Inrush current waveform

Conditions Vin : 115 VAC  
Iout : 100 % ( 16.7A )  
Istb : 100 %  
Ta : 25 °C

48V

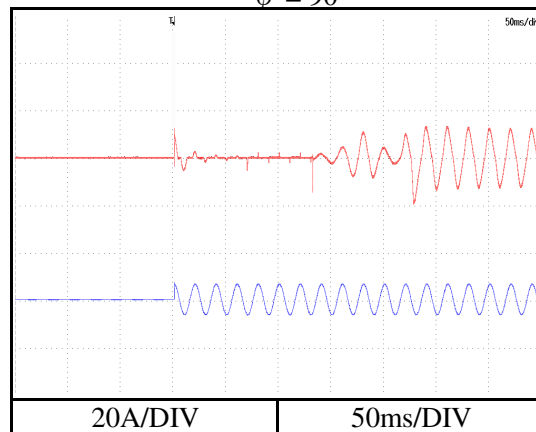
Switch on phase angle of input AC voltage  
 $\phi = 0^\circ$



← Iin →

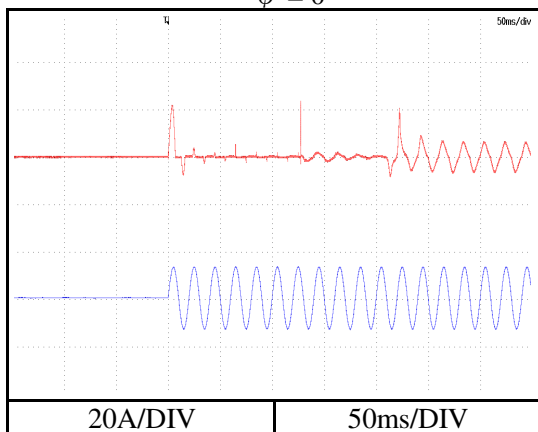
← Vin →

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



Conditions Vin : 230 VAC  
Iout : 100 % ( 16.7A )  
Istb : 100 %  
Ta : 25 °C

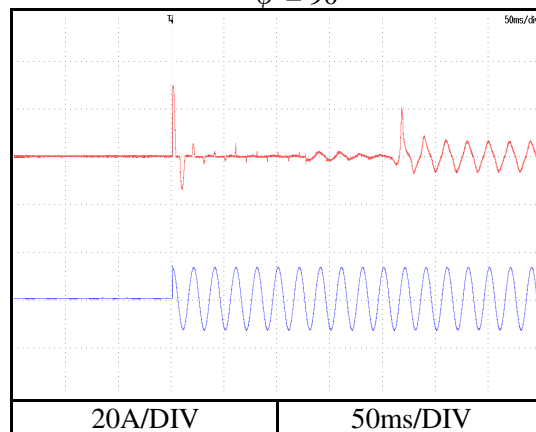
Switch on phase angle of input AC voltage  
 $\phi = 0^\circ$



← Iin →

← Vin →

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

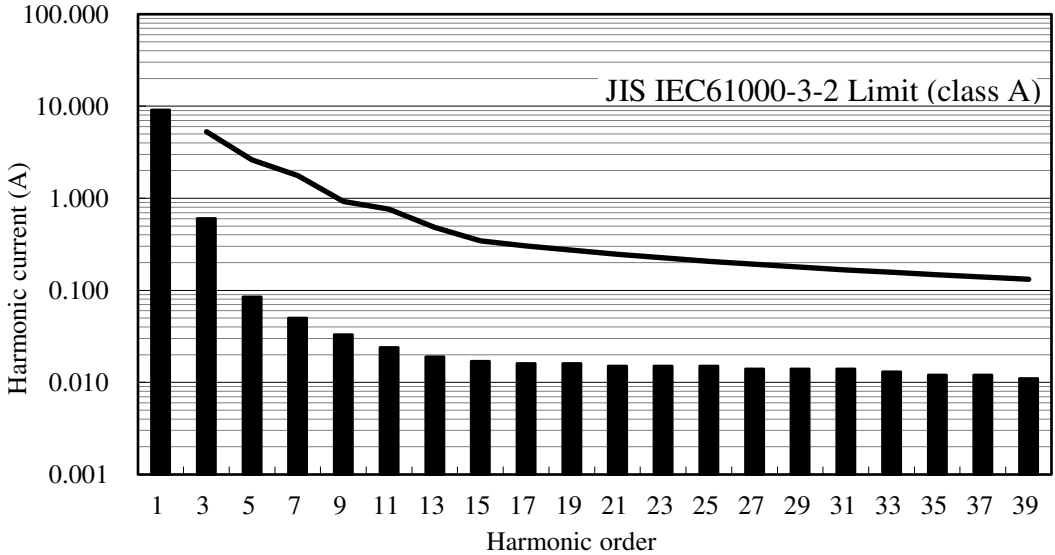


2-12. 高調波成分

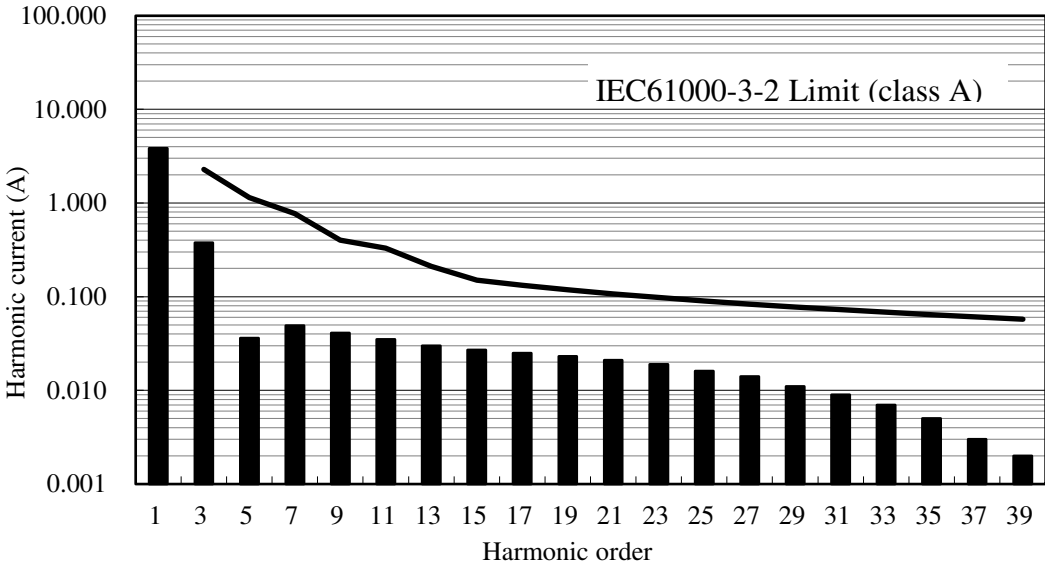
Input current harmonics

Conditions Vin : 100 VAC  
Iout : 16.7 A (100%)  
Istb : 100 %  
Ta : 25 °C

48V



Conditions Vin : 230 VAC  
Iout : 16.7 A (100%)  
Istb : 100 %  
Ta : 25 °C

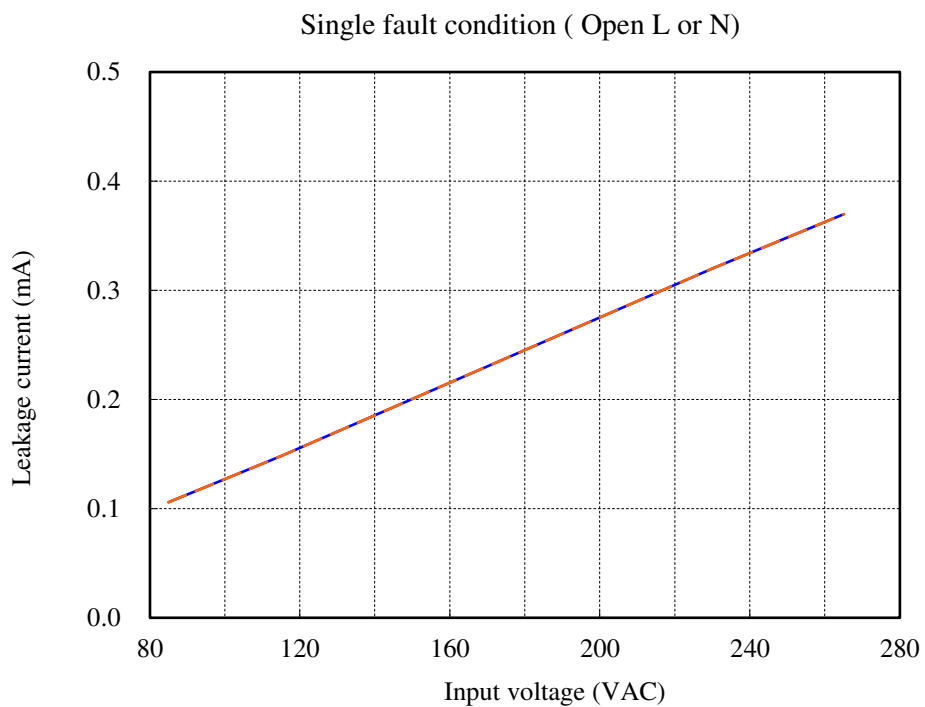
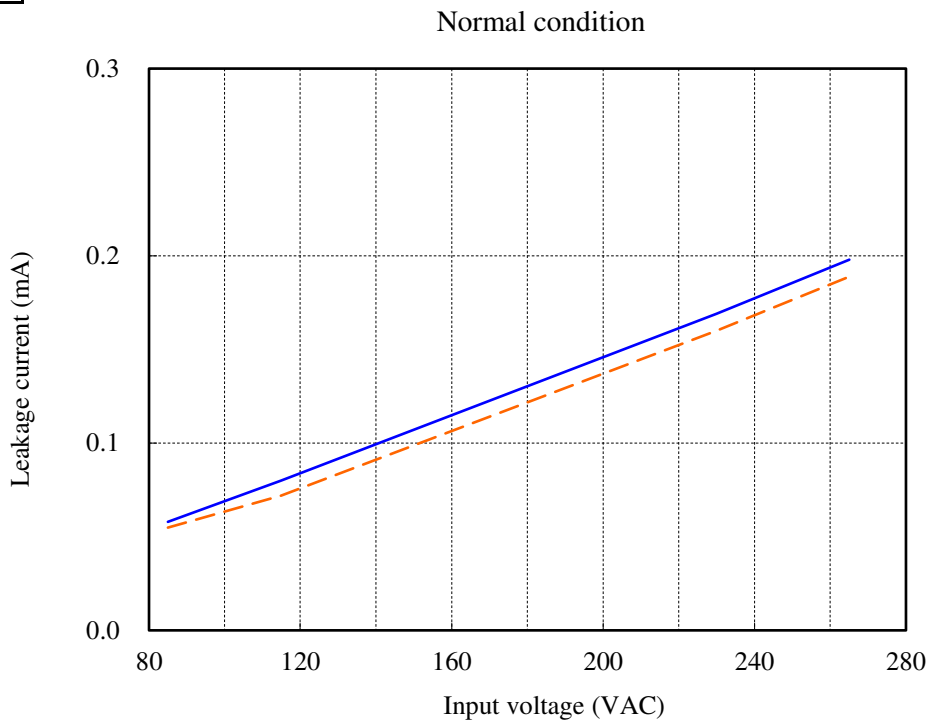


2-13. 漏洩電流特性

Leakage current characteristics  
 クラスI機器用接地漏洩電流特性  
 Earth leakage current of CLASS I equipment

Conditions Iout : 0 % ——— (blue solid line)  
 100 % - - - - (orange dashed line)  
 Ta : 25 °C  
 Istb : 100 %  
 f : 60 Hz

48V

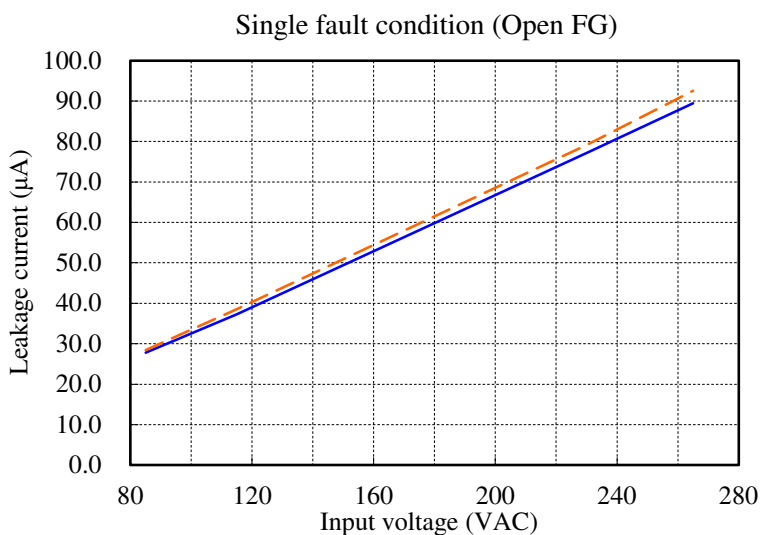
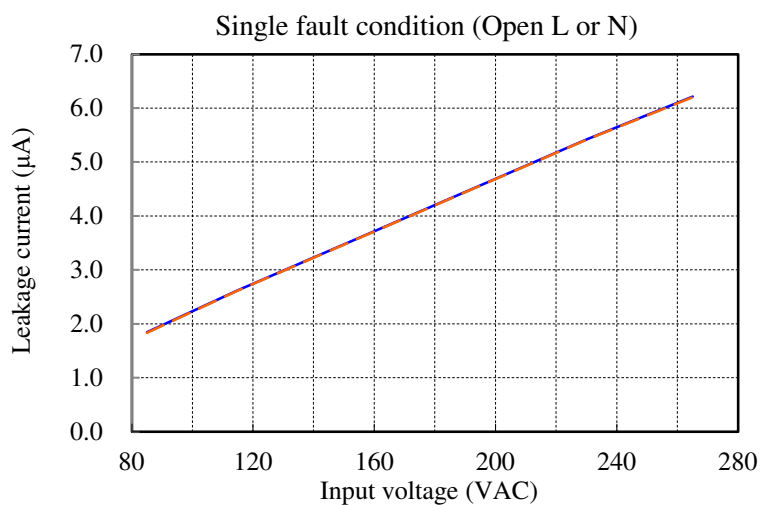
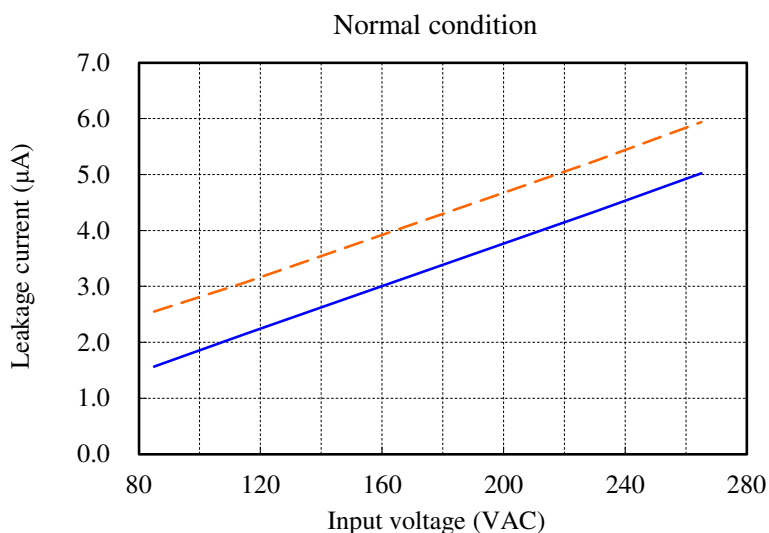


2-13. 漏洩電流特性

Leakage current characteristics  
 クラスI機器用患者漏洩電流特性  
 Patient leakage current of CLASS I equipment

Conditions Iout : 0 % ——— (blue line)  
 100 % - - - - - (orange line)  
 Ta : 25 °C  
 Istb : 100 %  
 f : 60 Hz

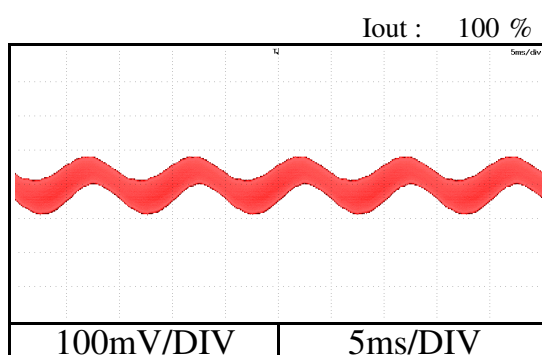
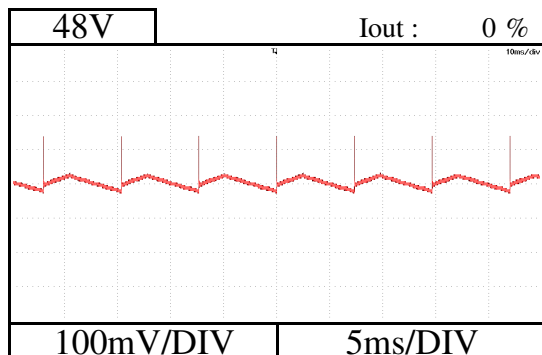
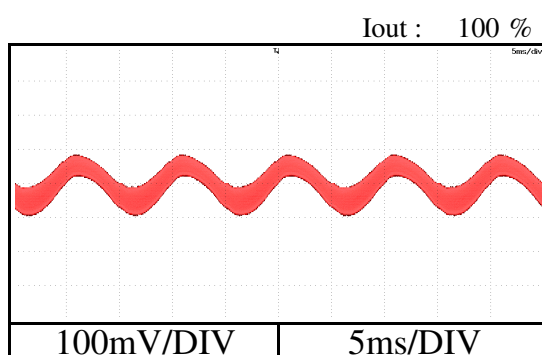
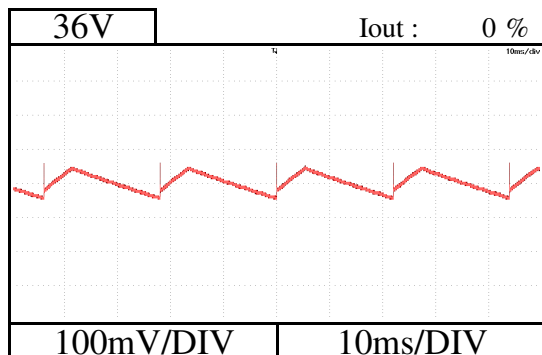
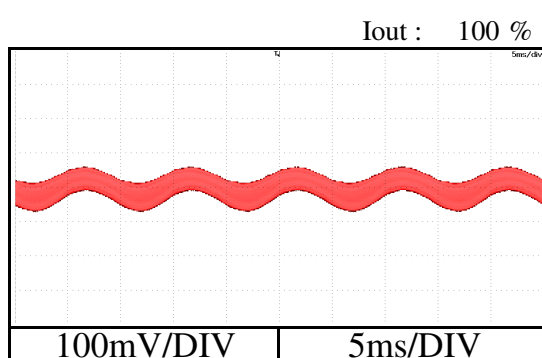
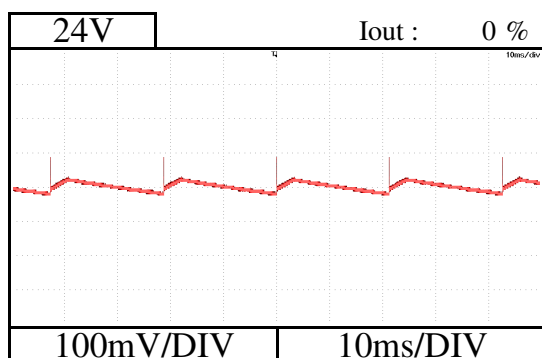
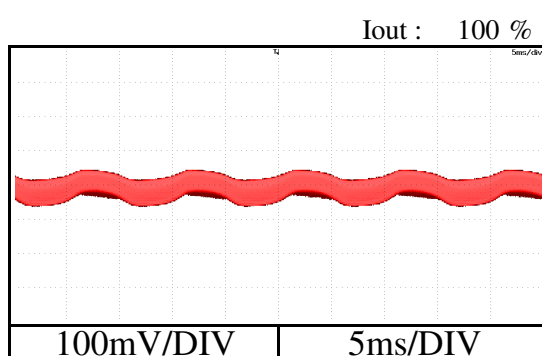
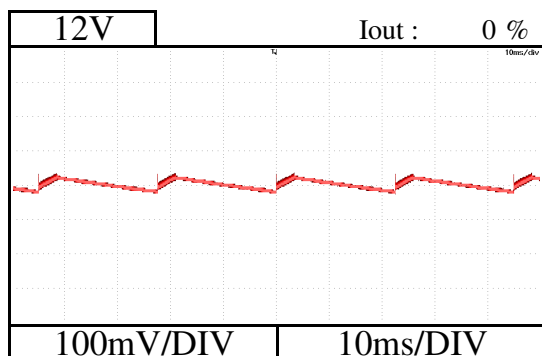
48V



2-14. 出力リップル、ノイズ波形

Output ripple and noise waveform

Conditions Vin : 115 VAC  
 Istb : 100 %  
 Ta : 25 °C



2-15. EMI特性

Electro-Magnetic Interference characteristics

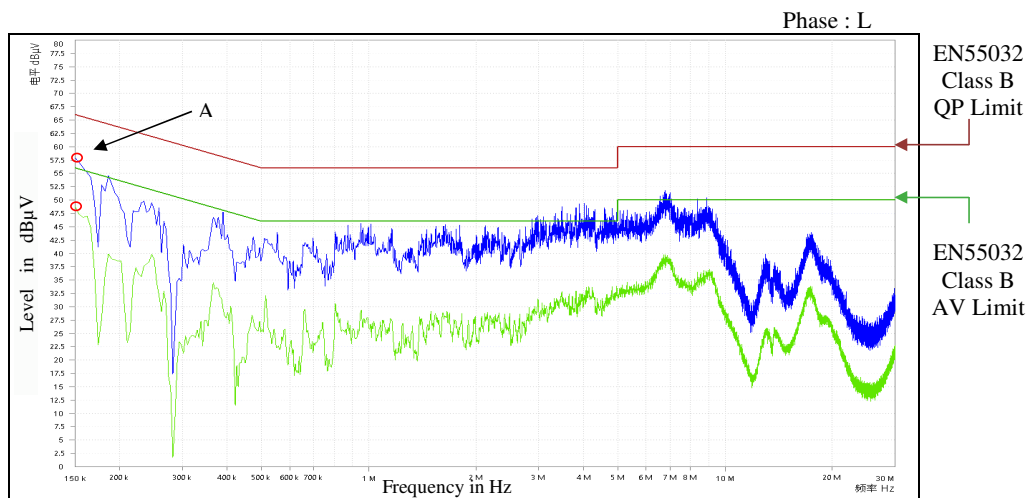
雑音端子電圧

Conducted Emission

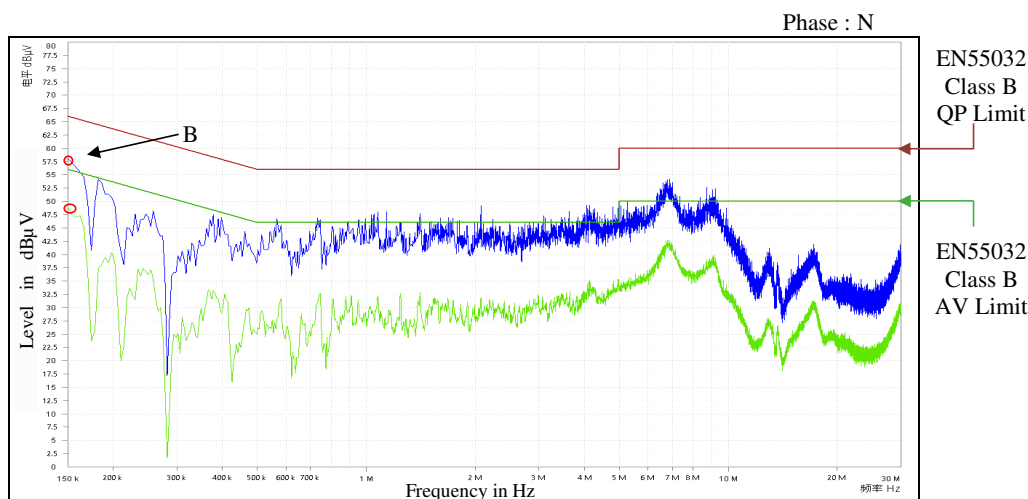
12V

Conditions Vin : 115 VAC  
 Iout : 56.7 A (100%)  
 Istb : 100 %  
 Ta : 25 °C

Point A (150kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	66.0	57.9
AV	56.0	48.7



Point B (150kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	66.0	58.0
AV	56.0	48.4



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

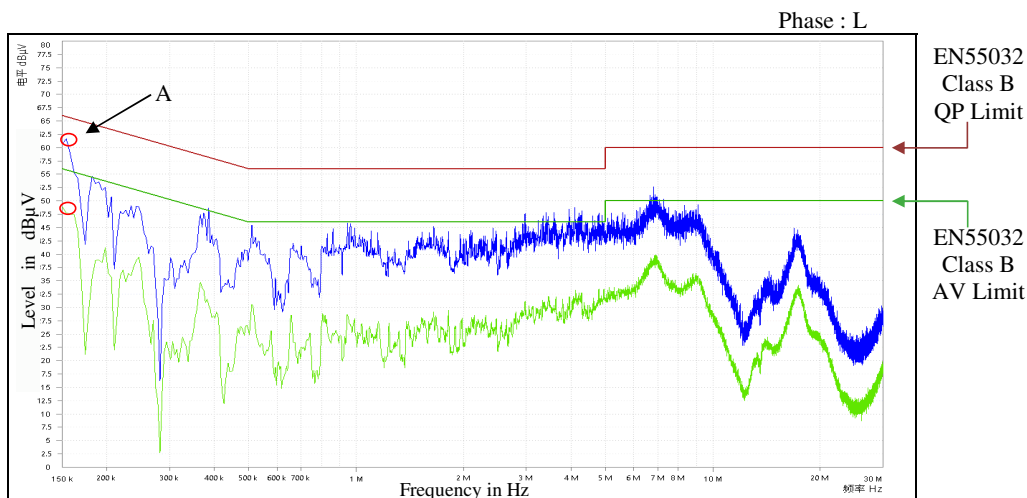
2-15. EMI特性

Electro-Magnetic Interference characteristics

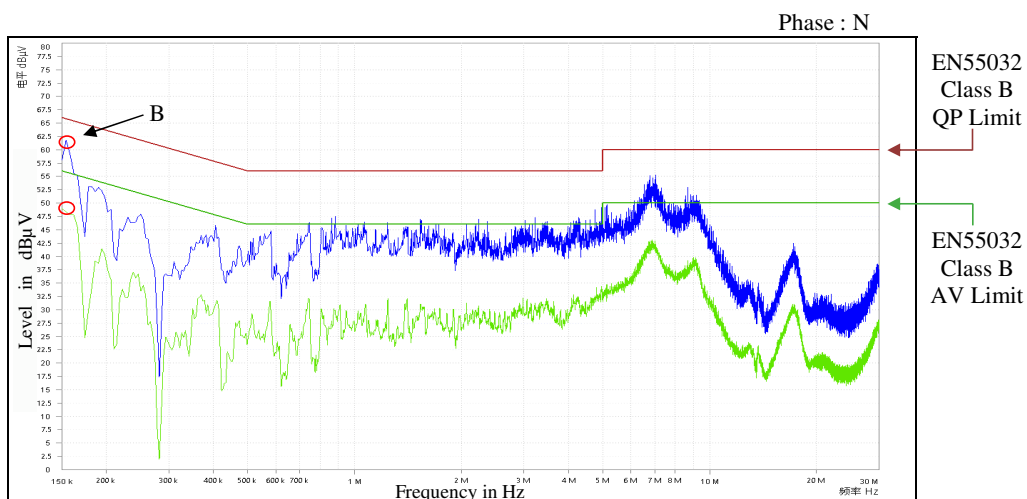
Conditions Vin : 230 VAC  
 Iout : 56.7 A (100%)  
 Istb : 100 %  
 Ta : 25 °C

雑音端子電圧  
 Conducted Emission  
 12V

Point A (154kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	65.8	60.2
AV	56.0	48.3



Point B (154kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	65.8	60.4
AV	56.0	48.5



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



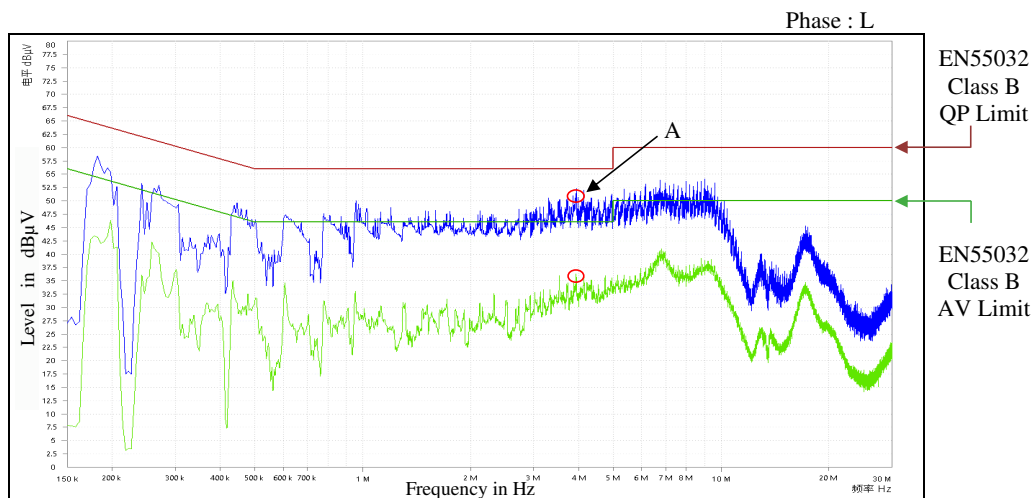
2-15. EMI特性

Electro-Magnetic Interference characteristics

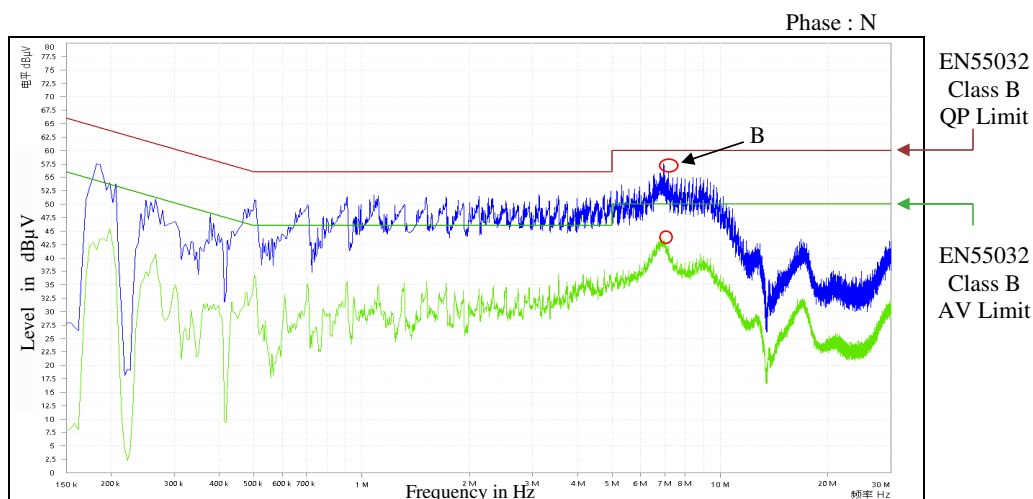
Conditions Vin : 115 VAC  
 Iout : 33.4 A (100%)  
 Istb : 100 %  
 Ta : 25 °C

雑音端子電圧  
 Conducted Emission  
 24V

Point A (3.934MHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	56.0	48.1
AV	46.0	36.3



Point B (6.966MHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	60.0	51.8
AV	50.0	42.4



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

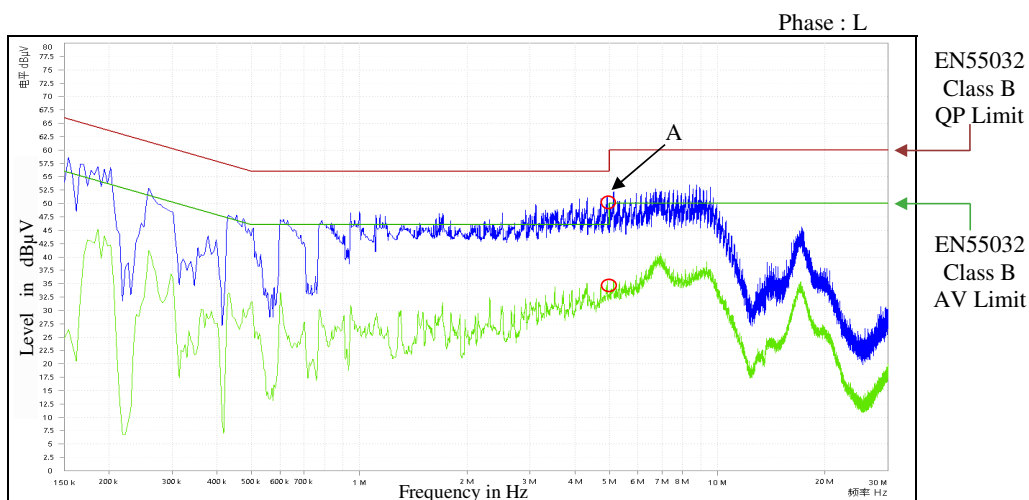
2-15. EMI特性

Electro-Magnetic Interference characteristics

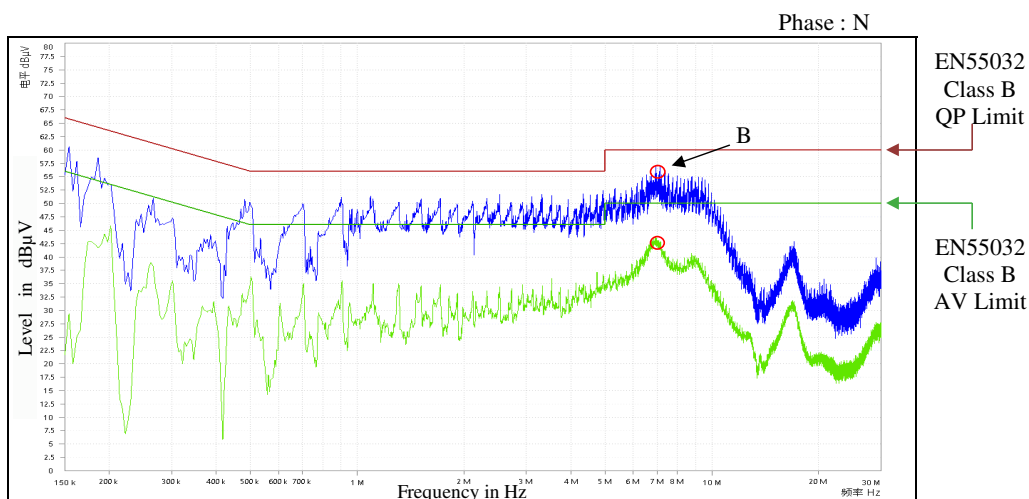
Conditions Vin : 230 VAC  
 Iout : 33.4 A (100%)  
 Istb : 100 %  
 Ta : 25 °C

雑音端子電圧  
 Conducted Emission  
 24V

Point A (4.93MHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	56.0	48.2
AV	46.0	35.5



Point B (6.962MHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	60.0	52.5
AV	50.0	42.5



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

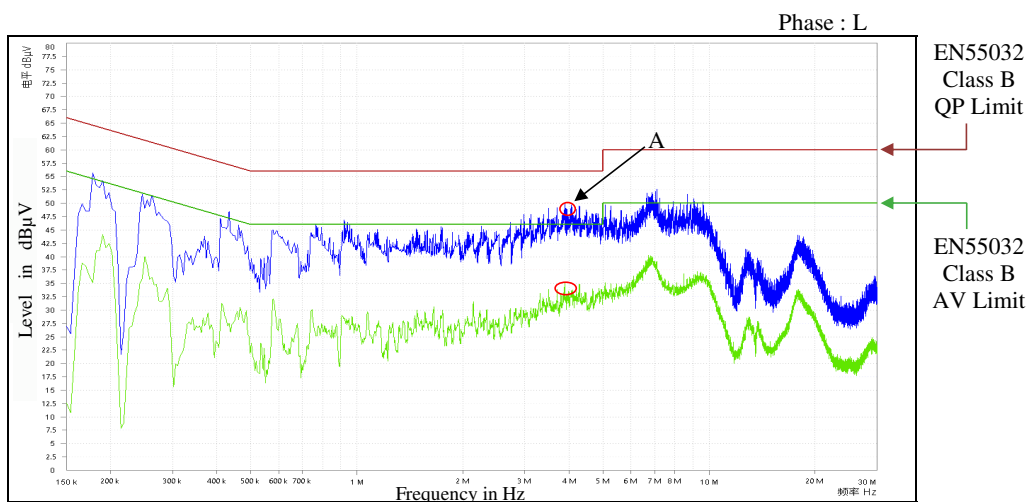
2-15. EMI特性

Electro-Magnetic Interference characteristics

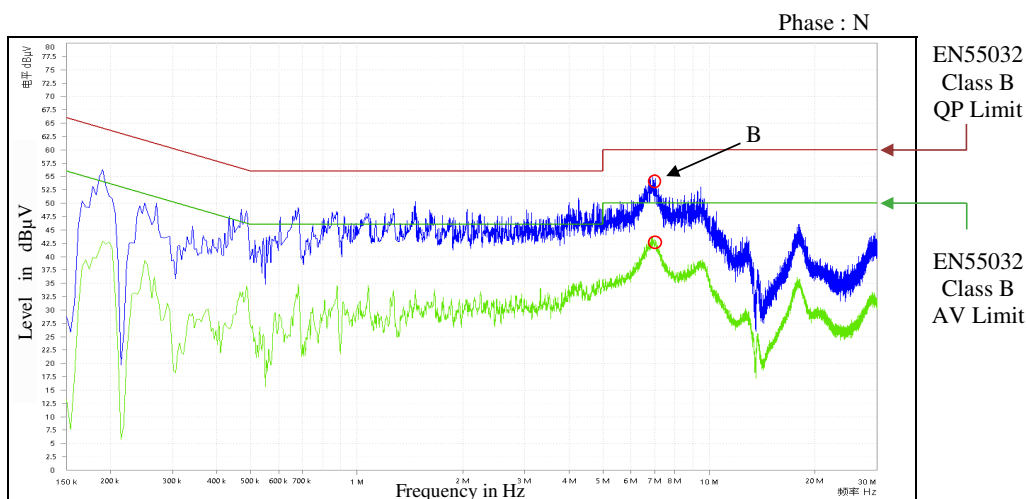
Conditions Vin : 115 VAC  
 Iout : 22.2 A (100%)  
 Istb : 100 %  
 Ta : 25 °C

雑音端子電圧  
 Conducted Emission  
 36V

Point A (3.902MHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	56.0	47.1
AV	46.0	35.1



Point B (6.922MHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	60.0	50.1
AV	50.0	42.7



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

2-15. EMI特性

Electro-Magnetic Interference characteristics

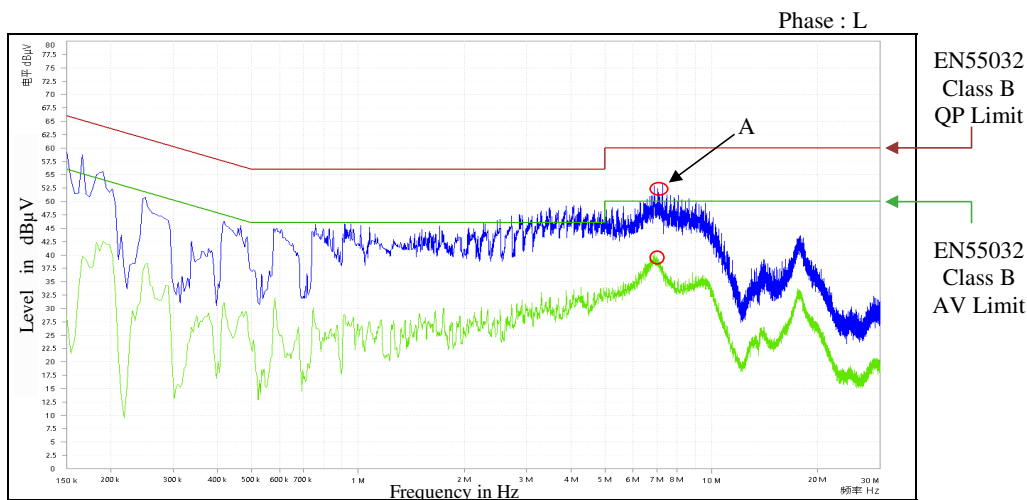
雑音端子電圧

Conducted Emission

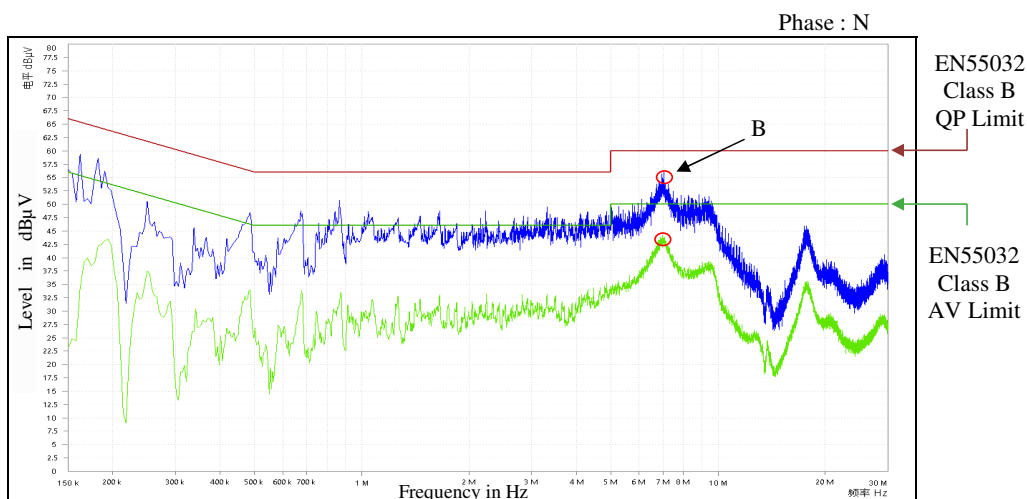
36V

Conditions Vin : 230 VAC  
 Iout : 22.2 A (100%)  
 Istb : 100 %  
 Ta : 25 °C

Point A (6.894MHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	60.0	51.0
AV	50.0	40.2



Point B (6.982MHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	60.0	51.6
AV	50.0	42.7



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

2-15. EMI特性

Electro-Magnetic Interference characteristics

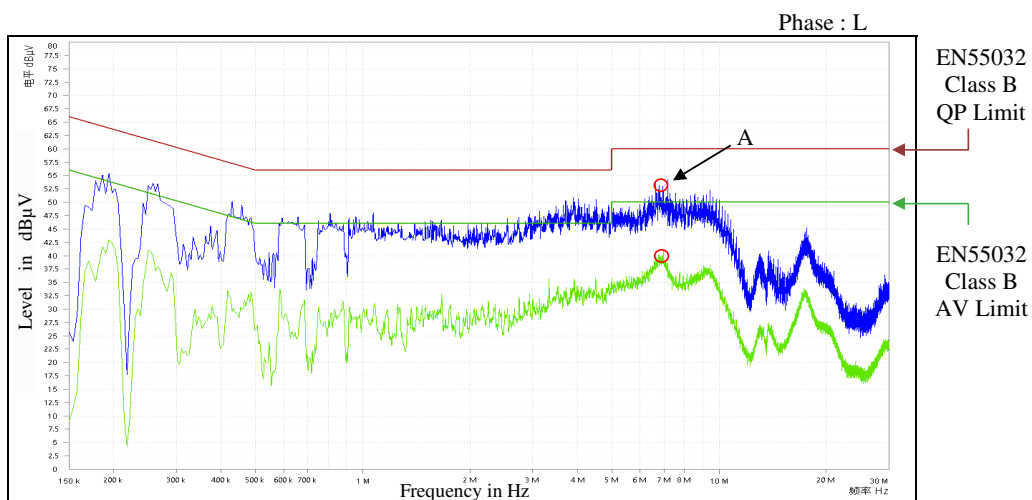
雑音端子電圧

Conducted Emission

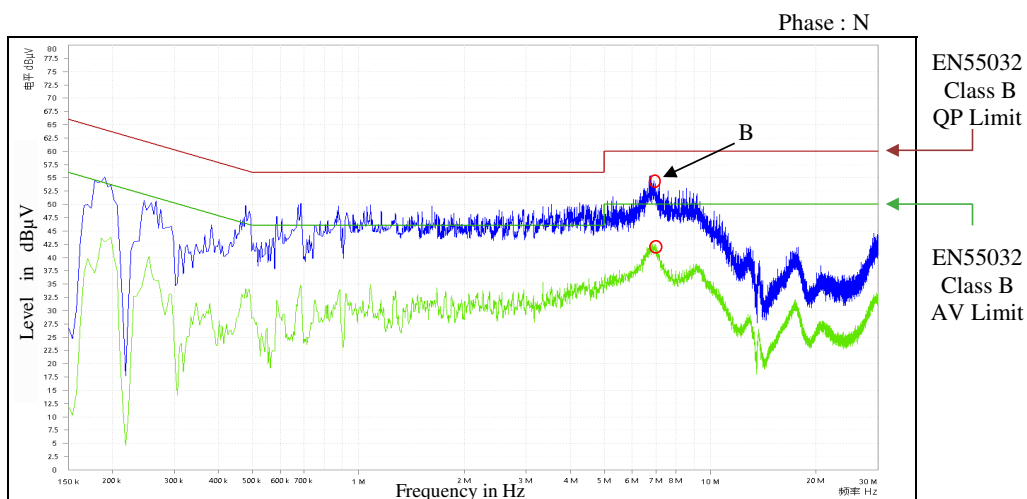
48V

Conditions Vin : 115 VAC  
 Iout : 16.7 A (100%)  
 Istb : 100 %  
 Ta : 25 °C

Ref. Data	Point A (6.974MHz)	
	Limit (dB)	Measure (dB)
QP	60.0	52.2
AV	50.0	39.3



Ref. Data	Point B (6.79MHz)	
	Limit (dB)	Measure (dB)
QP	60.0	52.3
AV	50.0	41.8



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

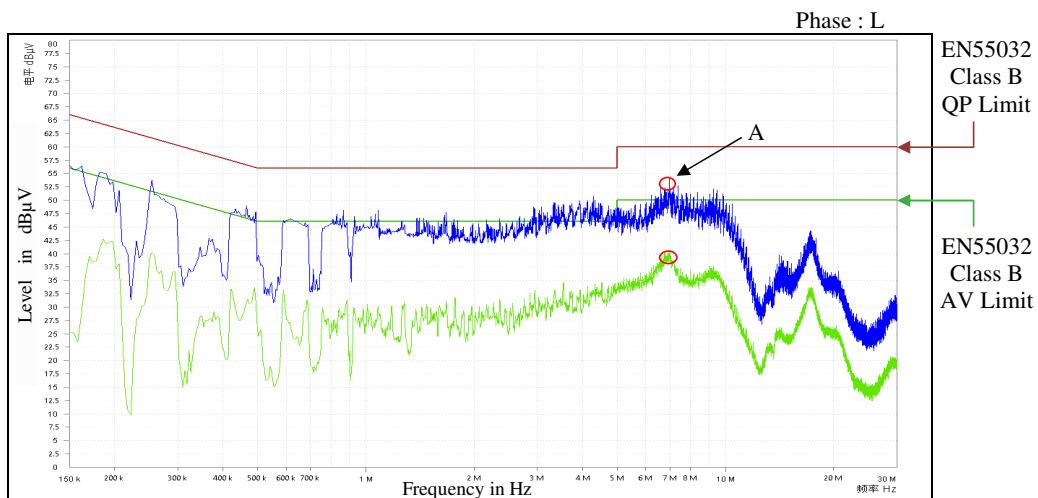
2-15. EMI特性

Electro-Magnetic Interference characteristics

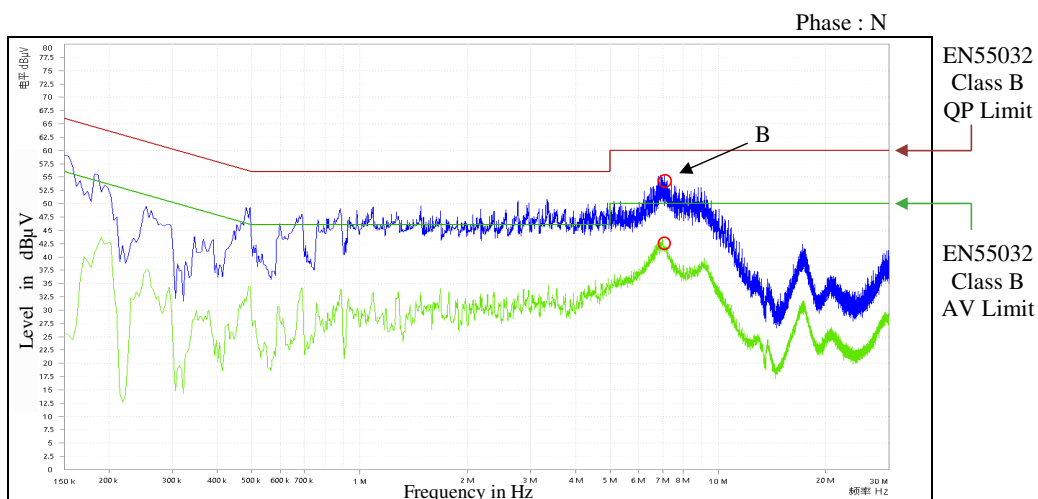
Conditions Vin : 230 VAC  
 Iout : 16.7 A (100%)  
 Istb : 100 %  
 Ta : 25 °C

雑音端子電圧  
 Conducted Emission  
 48V

Point A (6.998MHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	60.0	51.6
AV	50.0	39.5



Point B (6.814MHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	60.0	50.0
AV	50.0	42.3



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

2-15. EMI特性

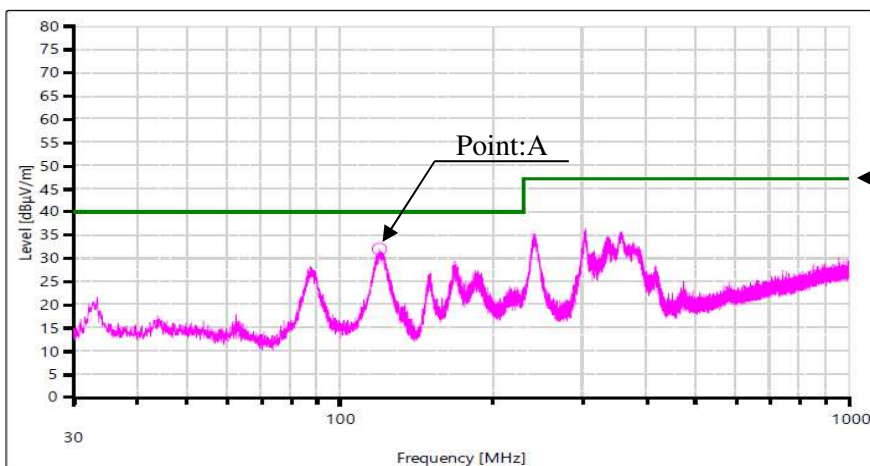
Electro-Magnetic Interference characteristics

Conditions Vin : 115 VAC  
 Iout : 56.7 A (100%)  
 Istb : 100 %  
 Ta : 25 °C

雑音電界強度  
 Radiated Emission

12V

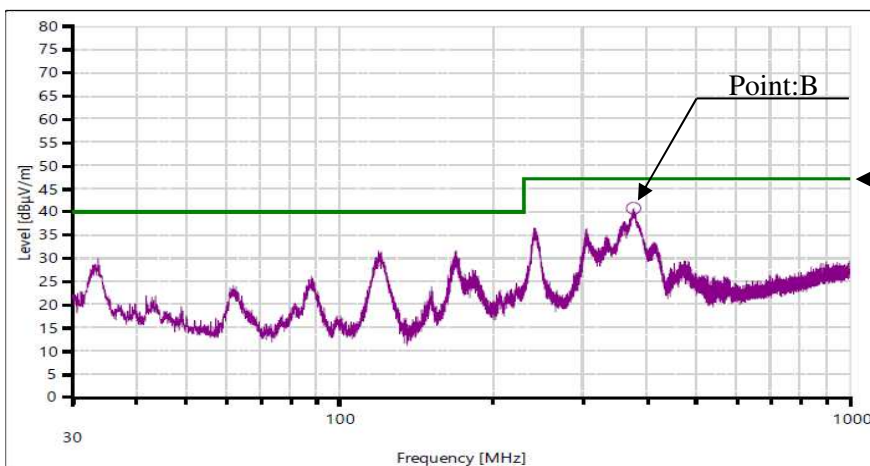
HORIZONTAL



EN55032  
 Class B  
 QP Limit

Point A (120MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	40.0	32.0

VERTICAL



EN55032  
 Class B  
 QP Limit

Point B (378MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	40.7

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

表示はピーク値  
 Indication is peak values.

2-15. EMI特性

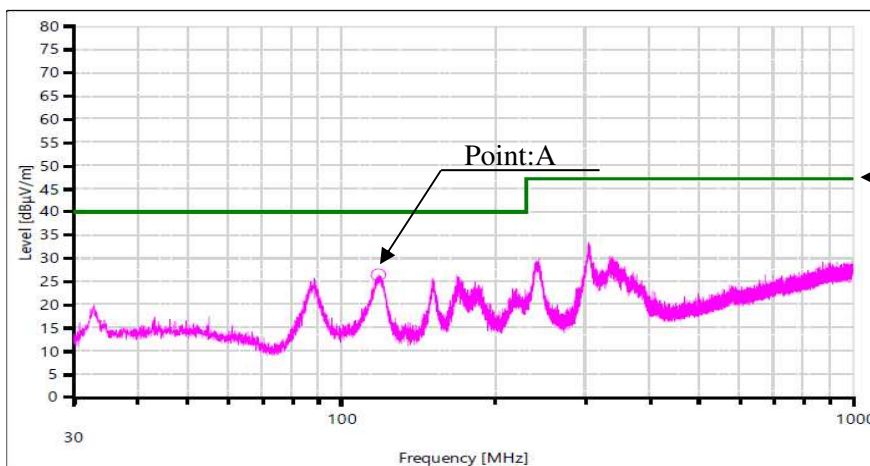
Electro-Magnetic Interference characteristics

Conditions Vin : 230 VAC  
 Iout : 56.7 A (100%)  
 Istb : 100 %  
 Ta : 25 °C

雑音電界強度  
 Radiated Emission

12V

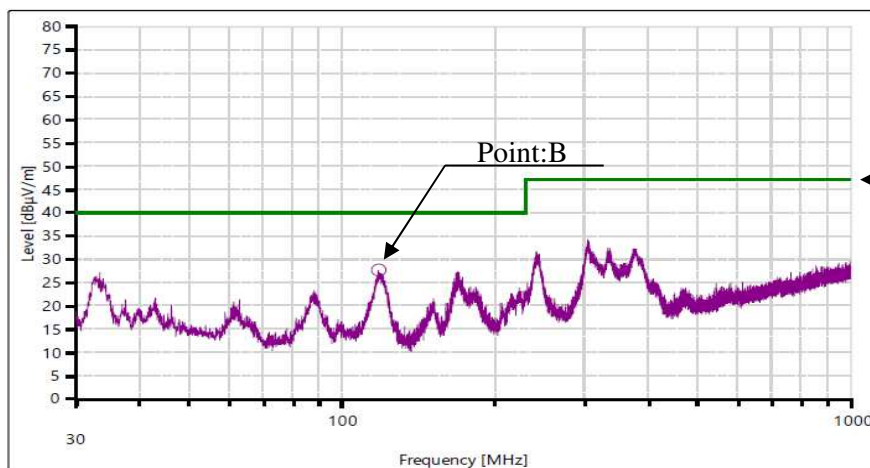
HORIZONTAL



EN55032  
 Class B  
 QP Limit

Point A (118MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	26.5

VERTICAL



EN55032  
 Class B  
 QP Limit

Point B (118MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	40.0	27.7

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

表示はピーク値  
 Indication is peak values.



2-15. EMI特性

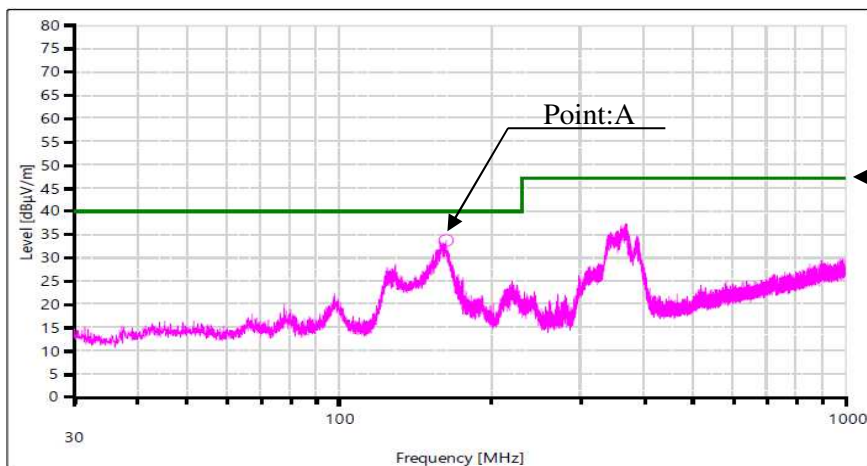
Electro-Magnetic Interference characteristics

Conditions Vin : 115 VAC  
 Iout : 33.4 A (100%)  
 Istb : 100 %  
 Ta : 25 °C

雑音電界強度  
 Radiated Emission

24V

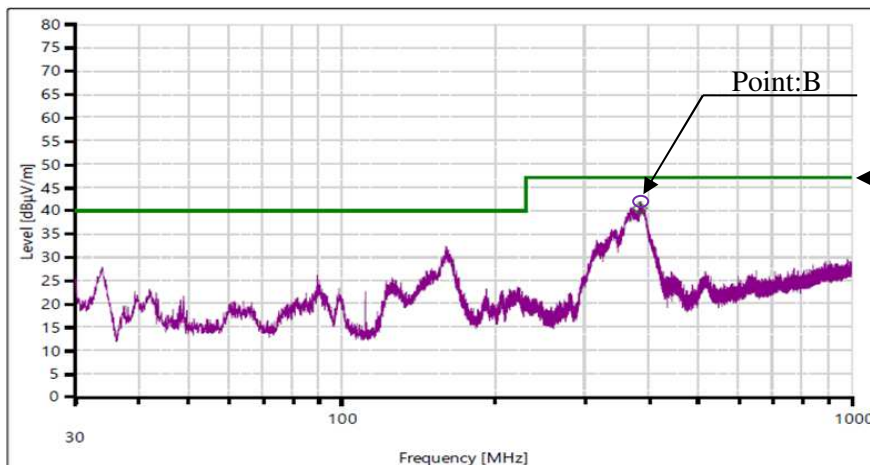
HORIZONTAL



EN55032  
 Class B  
 QP Limit

Point A (163MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	40.0	33.7

VERTICAL



EN55032  
 Class B  
 QP Limit

Point B (386MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	40.4

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

表示はピーク値  
 Indication is peak values.

2-15. EMI特性

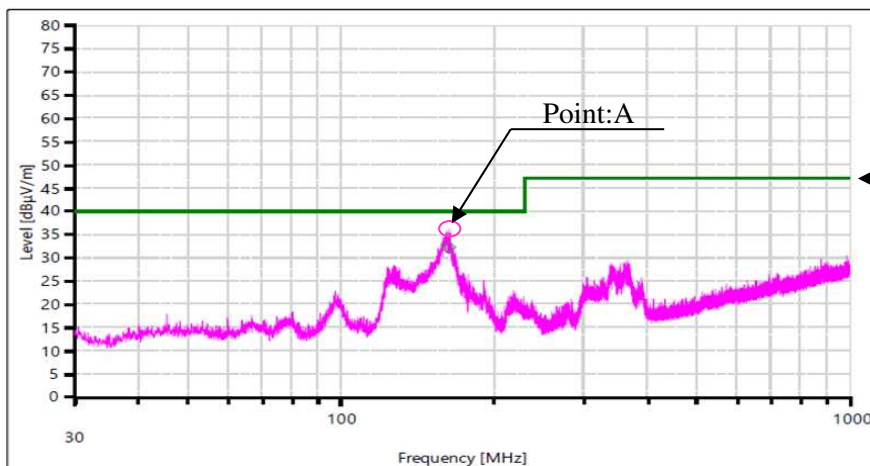
Electro-Magnetic Interference characteristics

Conditions Vin : 230 VAC  
 Iout : 33.4 A (100%)  
 Istb : 100 %  
 Ta : 25 °C

雑音電界強度  
 Radiated Emission

24V

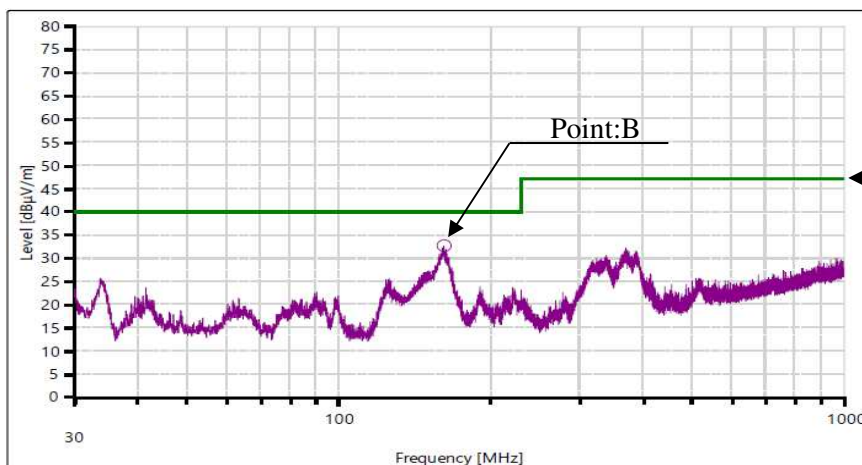
HORIZONTAL



EN55032  
 Class B  
 QP Limit

Point A (163MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	40.0	32.3

VERTICAL



EN55032  
 Class B  
 QP Limit

Point B (162MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	40.0	32.8

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

表示はピーク値  
 Indication is peak values.

2-15. EMI特性

Electro-Magnetic Interference characteristics

Conditions Vin : 115 VAC

Iout : 22.2 A (100%)

雑音電界強度

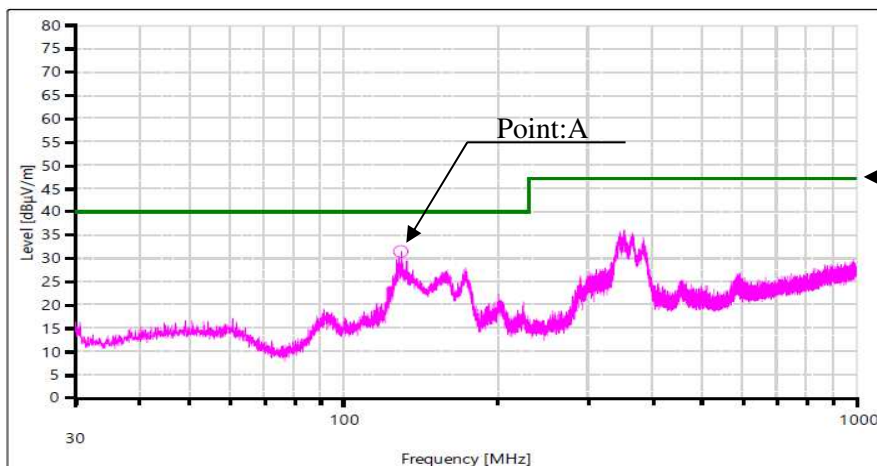
Istb : 100 %

Radiated Emission

Ta : 25 °C

36V

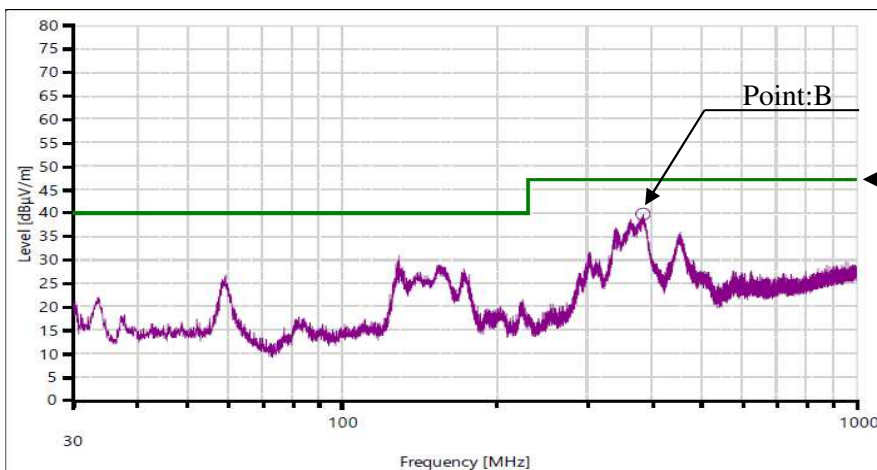
HORIZONTAL



EN55032  
Class B  
QP Limit

Point A (130MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	40.0	31.4

VERTICAL



EN55032  
Class B  
QP Limit

Point B (386MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	39.7

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

表示はピーク値  
Indication is peak values.

2-15. EMI特性

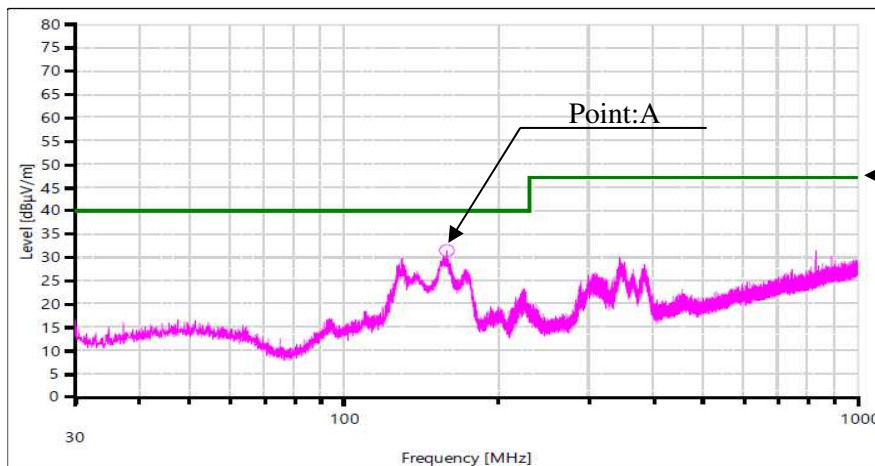
Electro-Magnetic Interference characteristics

Conditions Vin : 230 VAC  
 Iout : 22.2 A (100%)  
 Istb : 100 %  
 Ta : 25 °C

雑音電界強度  
 Radiated Emission

36V

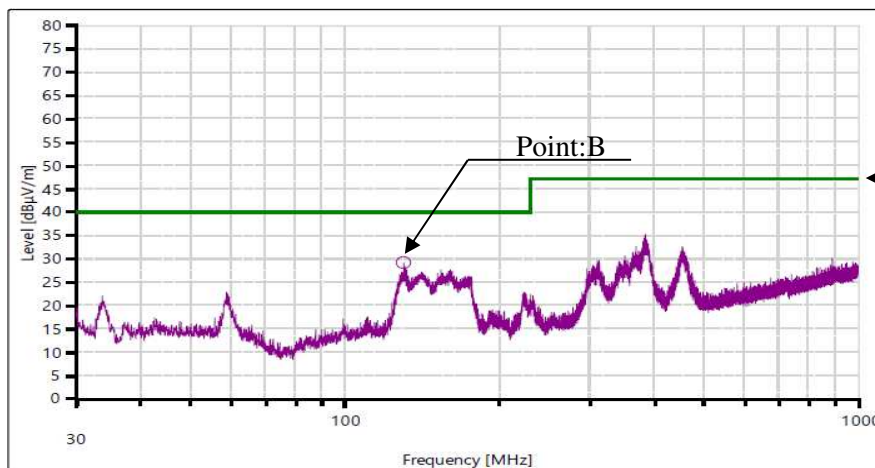
HORIZONTAL



EN55032  
 Class B  
 QP Limit

Point A (159MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	40.0	31.6

VERTICAL



EN55032  
 Class B  
 QP Limit

Point B (130MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	40.0	29.2

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

表示はピーク値  
 Indication is peak values.

2-15. EMI特性

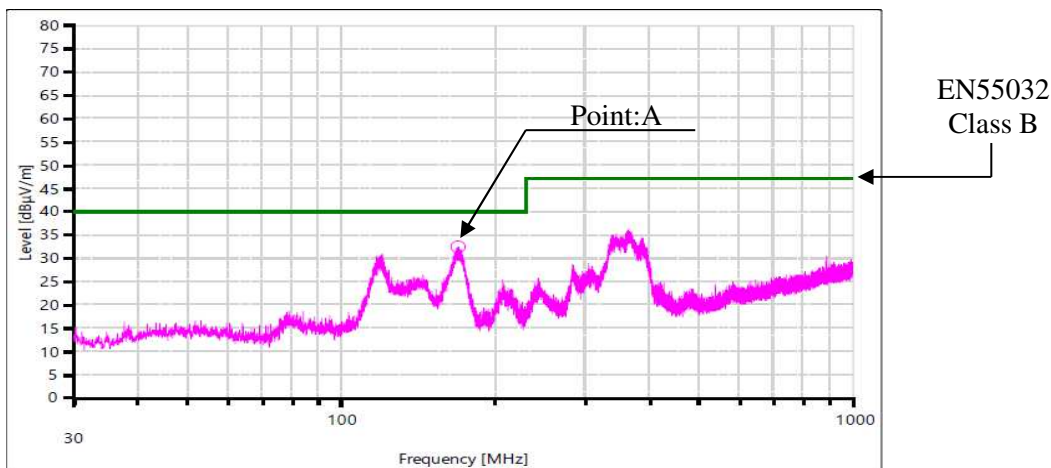
Electro-Magnetic Interference characteristics

Conditions Vin : 115 VAC  
 Iout : 16.7 A (100%)  
 Istb : 100 %  
 Ta : 25 °C

雑音電界強度  
 Radiated Emission

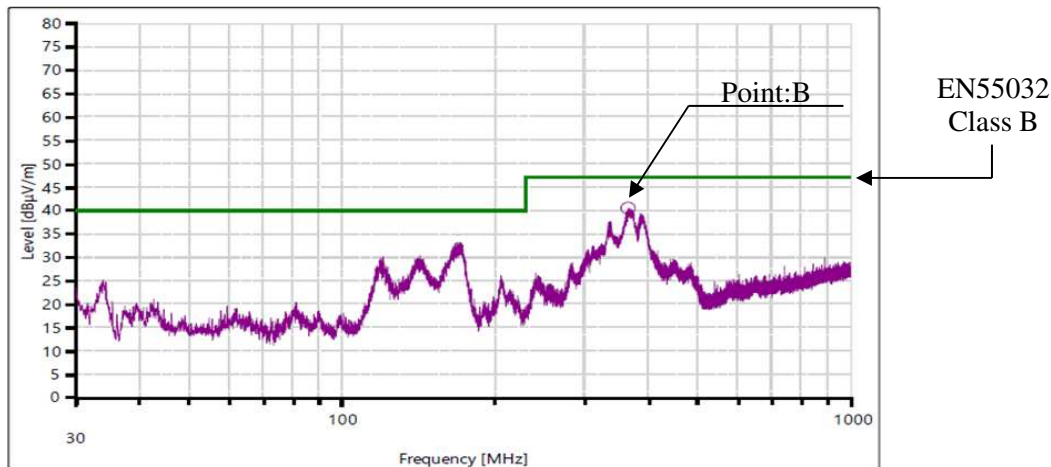
48V

HORIZONTAL



Point A (169MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	40.0	32.5

VERTICAL



Point B (367MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	40.4

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

表示はピーク値  
 Indication is peak values.

2-15. EMI特性

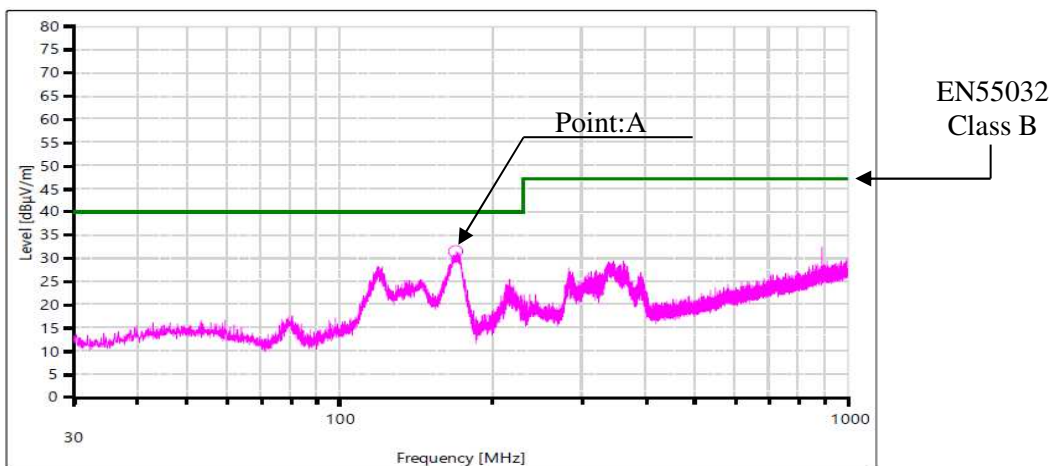
Electro-Magnetic Interference characteristics

Conditions Vin : 230 VAC  
 Iout : 16.7 A (100%)  
 Istb : 100 %  
 Ta : 25 °C

雑音電界強度  
 Radiated Emission

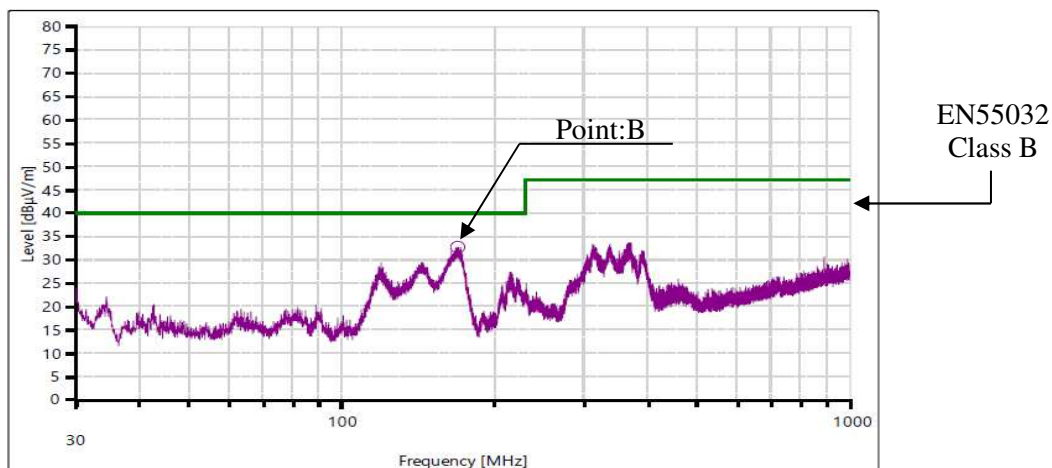
48V

HORIZONTAL



Point A (170MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	40.0	31.5

VERTICAL



Point B (169MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	40.0	32.8

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

表示はピーク値  
 Indication is peak values.

2-16. ファン可聴ノイズ

Audible Noise of FAN

Test condition: ackground noise: 23 [dB(A)]

Test duration: 60 [s]

Vin: 115VAC @ 60Hz ———  
 230VAC @ 50Hz - - - - -

Iout: 100% (33.4A)

Istb: 100% (2A)

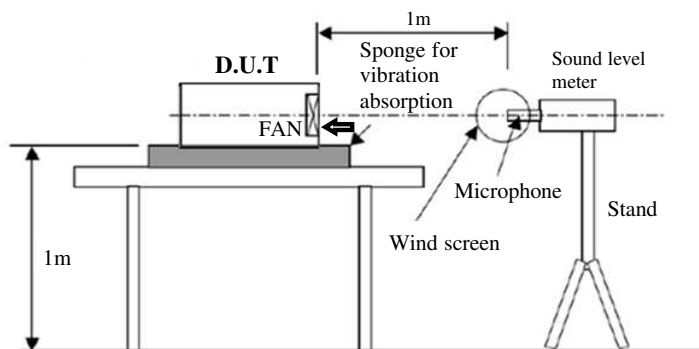
Ta: 25°C

試験装置

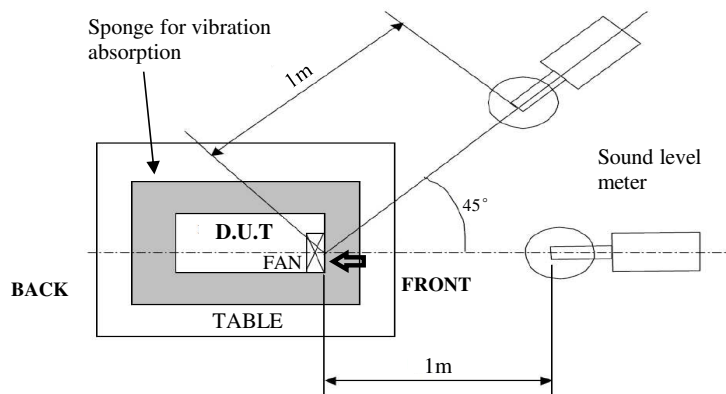
Test equipment :

Sound Calibrator Type 4231 (B&K)

Audio Analyzer: Type 3560-C (B&K)



Basic setting of sound measurements



Position of a sound meter intake surface (air inlet)

FANの可聴ノイズ曲線

Audible Noise Curve of FAN:

