

CME1000A

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

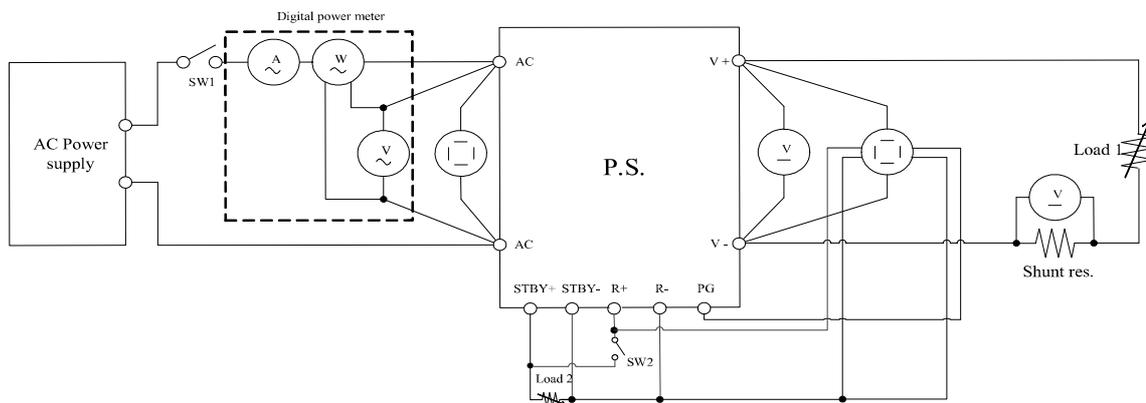
※ 当社測定条件における結果であり、参考値としてお考え願います。
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

1-1. 測定回路 Circuit used for determination

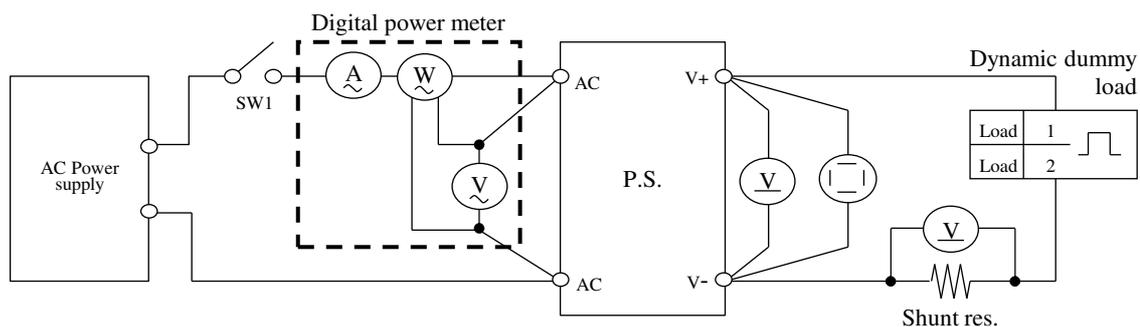
測定回路1 Circuit 1 used for determination

- 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

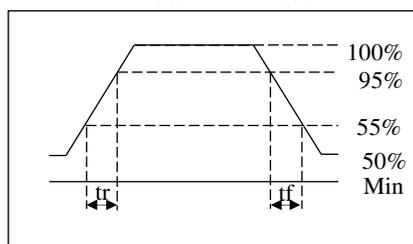


測定回路2 Circuit 2 used for determination

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

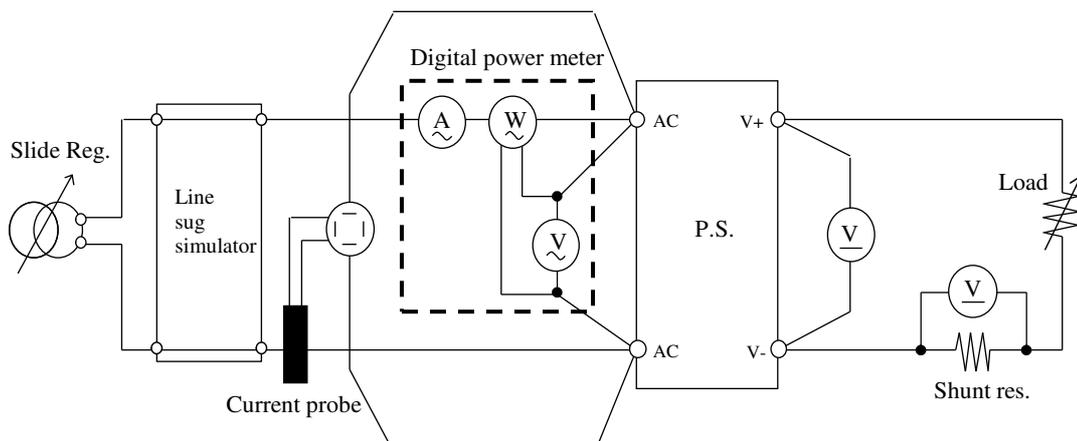


Output current waveform
Iout 50% <==> 100%



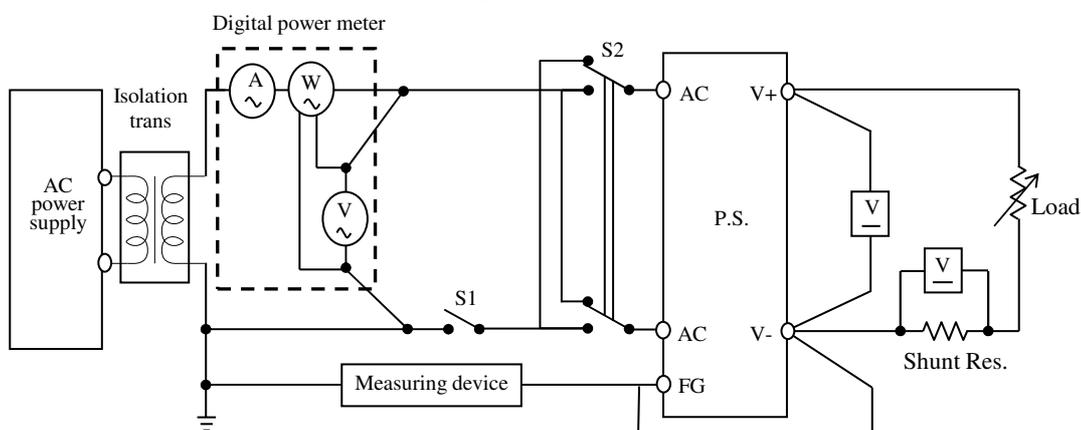
測定回路3 Circuit 3 used for determination

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



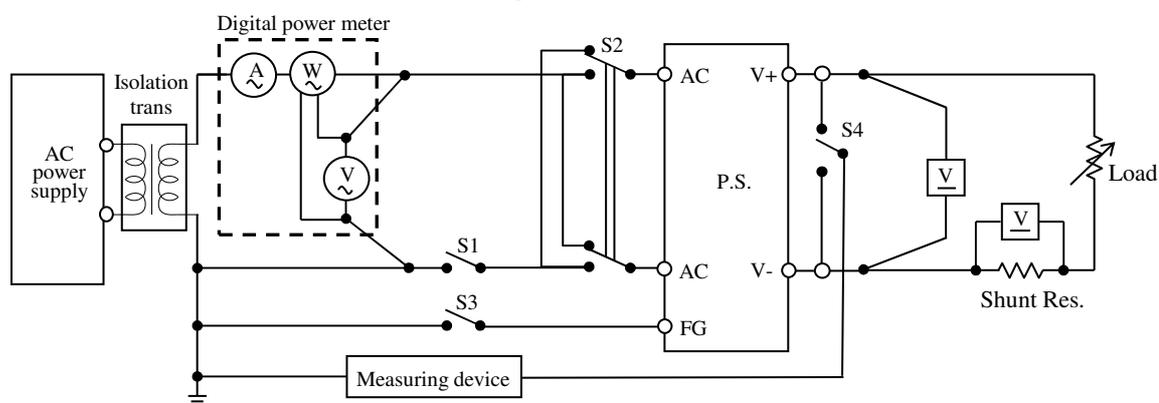
測定回路4 Circuit 4 used for determination

- ・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:

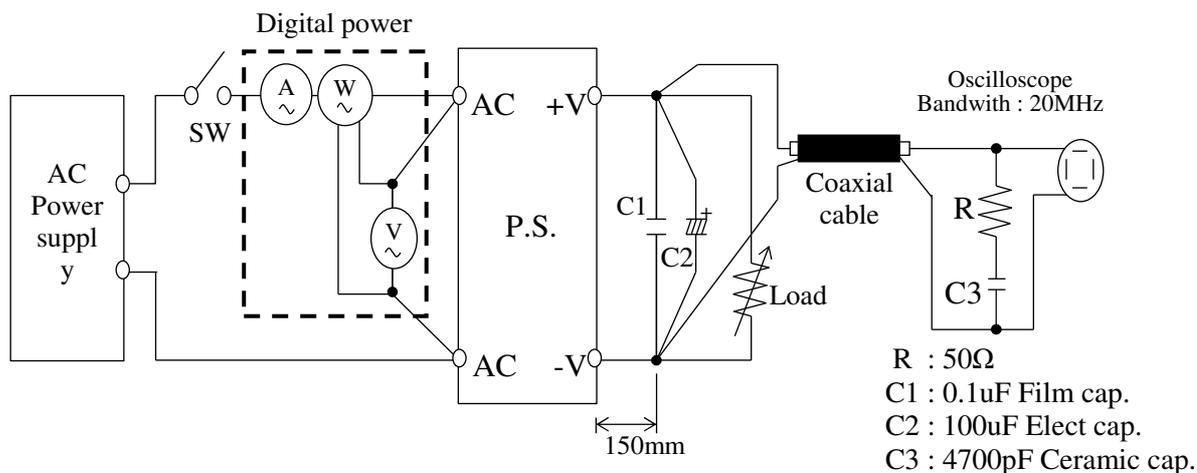
スイッチ:S1,S3を閉じて、スイッチ:S2,S4の接点箇所ので通常状態での漏洩電流測定を行います。
スイッチ:S1もしくはS3のどちらかを開にすることで、単一故障状態へ切り替えを行います。

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

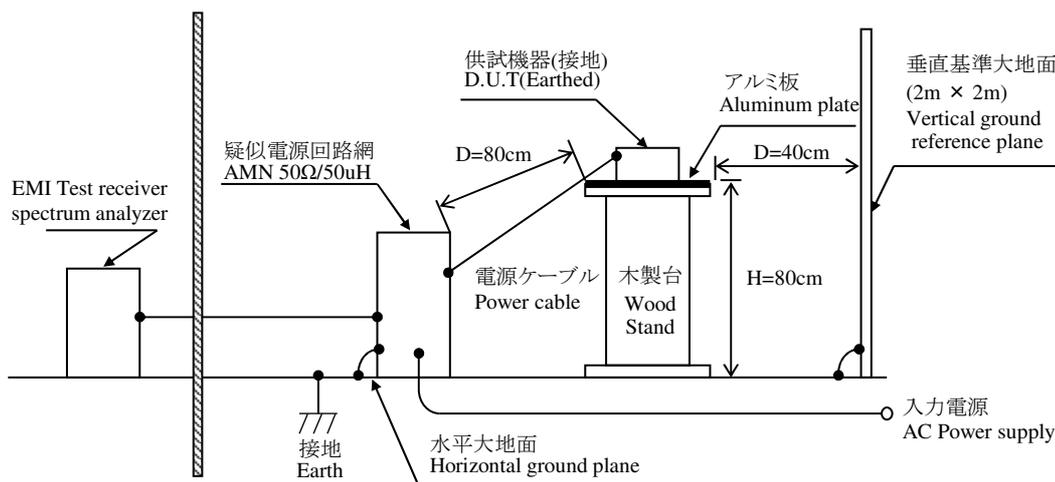
・出力リップル、ノイズ波形 Output ripple and noise waveform



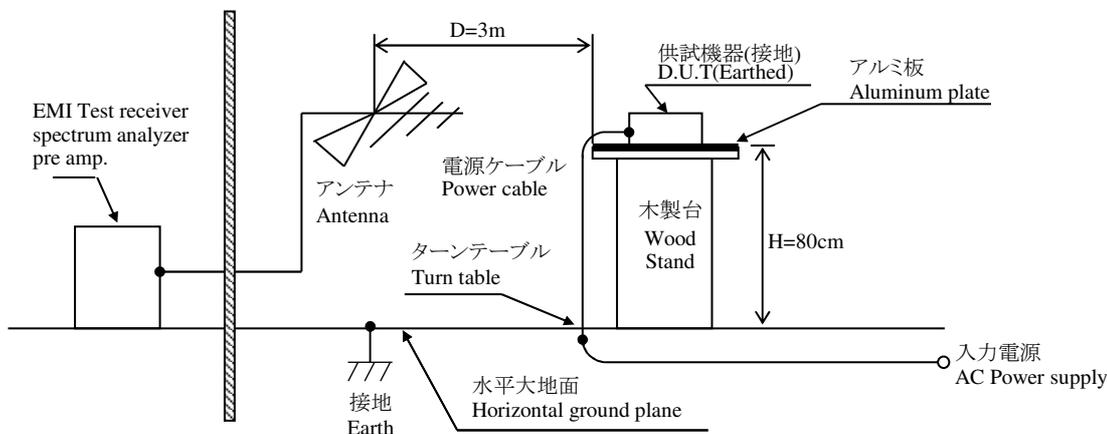
測定構成 Configuration used for determination

・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 _{in}	I _{out}	12V	24V	36V	48V
85 - 265VAC	50%	33.35A	20.85A	13.9A	10.45A
85VAC	90%	60.03A	37.53A	25.02A	18.81A
90 - 265VAC	100%	66.7A	41.7A	27.8A	20.9A
85 - 265VAC	50%Peak	41.7A	-	-	-
85 - 265VAC	Peak	83.4A	-	-	-

*V_{stb}=5V, I_{stb}=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 % (66.7A)
Istb : 0 %

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	Line regulation	
0%	12.034V	12.033V	12.033V	12.032V	2mV	0.017%
50%	12.018V	12.015V	12.016V	12.015V	3mV	0.025%
100%	-	12.003V	12.001V	12.001V	2mV	0.017%
Peak	-	11.998V	11.997V	11.998V	1mV	0.008%
Load	16mV	35mV	36mV	34mV		
regulation	0.133%	0.292%	0.300%	0.283%		

2. Temperature drift

Condition Vin : 115 VAC
Iout : 100 % (66.7A)
Istb : 0 %

Ta	-20°C	+25°C	+55°C	Temperature stability	
Vout	11.986V	11.995V	11.999V	13mV	0.108%

3. Start up voltage and Drop out voltage

Condition Ta : 25 °C
Iout : Peak (83.4A)
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 % (41.7A)
Istb : 0 %

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	Line regulation	
0%	23.996V	23.995V	23.995V	23.995V	1mV	0.004%
50%	23.978V	23.978V	23.979V	23.976V	3mV	0.013%
100%	-	23.961V	23.964V	23.959V	5mV	0.021%
Load	18mV	34mV	31mV	36mV		
regulation	0.075%	0.142%	0.129%	0.150%		

2. Temperature drift

Condition Vin : 115 VAC
Iout : 100 % (41.7A)
Istb : 0 %

Ta	-20°C	+25°C	+55°C	Temperature stability	
Vout	23.964V	23.965V	23.965V	1mV	0.004%

3. Start up voltage and Drop out voltage

Condition Ta : 25 °C
Iout : 100 % (41.7A)
Istb : 0 %

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

(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 % (27.8A)

Istb : 0 %

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	Line regulation	
0%	36.019V	36.018V	36.021V	36.022V	4mV	0.011%
50%	36.004V	36.002V	36.005V	36.004V	3mV	0.008%
100%	-	35.992V	35.995V	35.995V	3mV	0.008%
Load regulation	15mV	26mV	26mV	27mV		
	0.042%	0.072%	0.072%	0.075%		

2. Temperature drift

Condition Vin : 115 VAC

Iout : 100 % (27.8A)

Istb : 0 %

Ta	-20°C	+25°C	+55°C	Temperature stability	
Vout	35.957V	35.983V	35.983V	26mV	0.072%

3. Start up voltage and Drop out voltage

Conc Ta : 25 °C

Iout : 100 % (27.8A)

Istb : 0 %

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

48V

1. Regulation - line and load

Condition Ta : 25 °C

Iout : 100 % (20.9A)

Istb : 0 %

Iout \ Vin	85VAC	115VAC	230VAC	265VAC	Line regulation	
0%	48.050V	48.055V	48.050V	48.050V	5mV	0.010%
50%	48.026V	48.034V	48.023V	48.024V	11mV	0.023%
100%	-	48.028V	48.015V	48.016V	13mV	0.027%
Load regulation	24mV	27mV	35mV	34mV		
	0.050%	0.056%	0.073%	0.071%		

2. Temperature drift

Condition Vin : 115 VAC

Iout : 100 % (20.9A)

Istb : 0 %

Ta	-20°C	+25°C	+55°C	Temperature stability	
Vout	47.975V	48.019V	48.023V	48mV	0.100%

3. Start up voltage and Drop out voltage

Condition Ta : 25 °C

Iout : 100 % (20.9A)

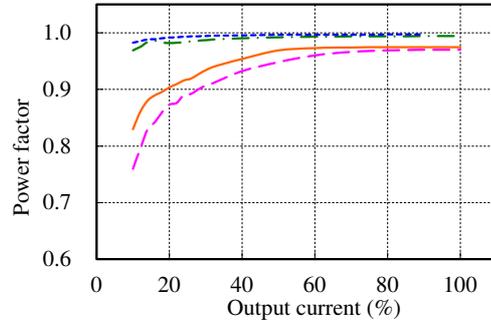
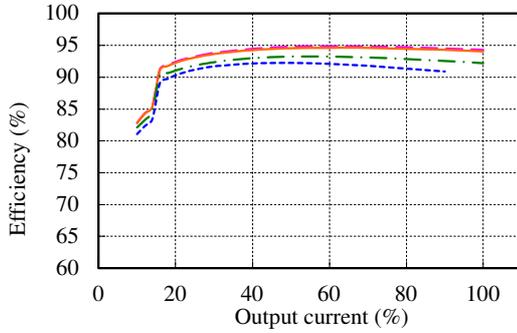
Istb : 0 %

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

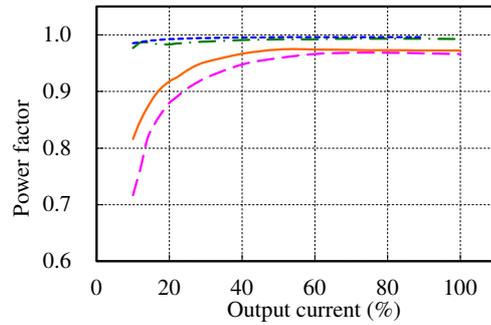
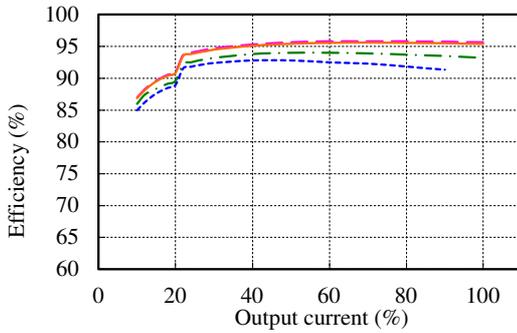
(2) 効率・力率対出力電流
Efficiency and Power factor vs. Output current

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

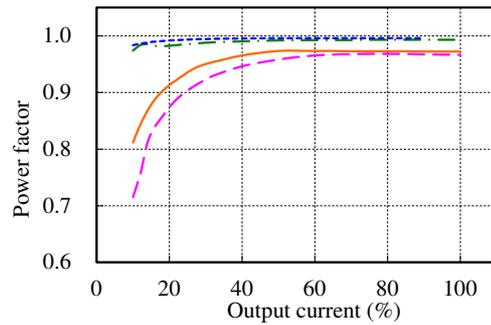
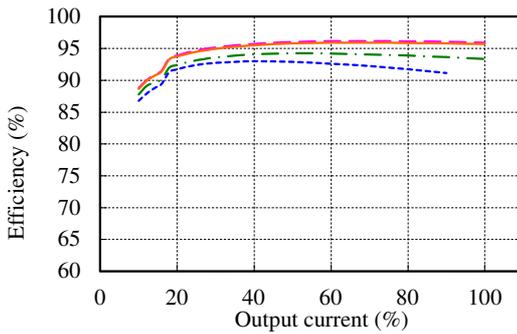
12V



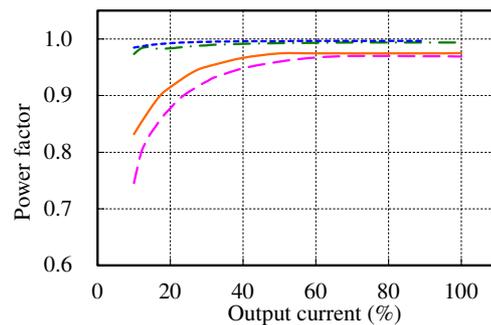
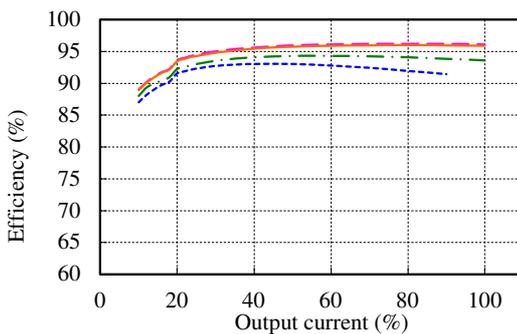
24V



36V



48V



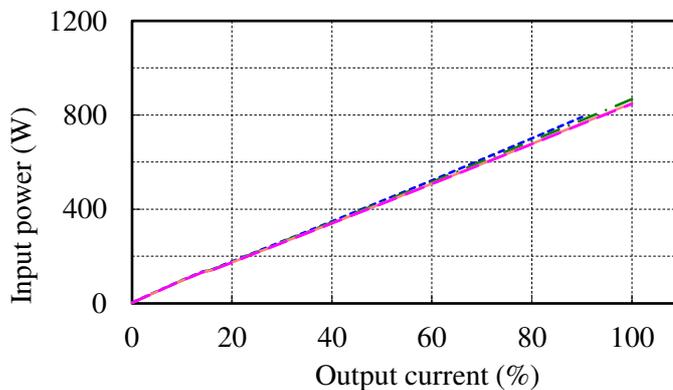
(3) 入力電力対出力電流

Input power vs. Output current

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

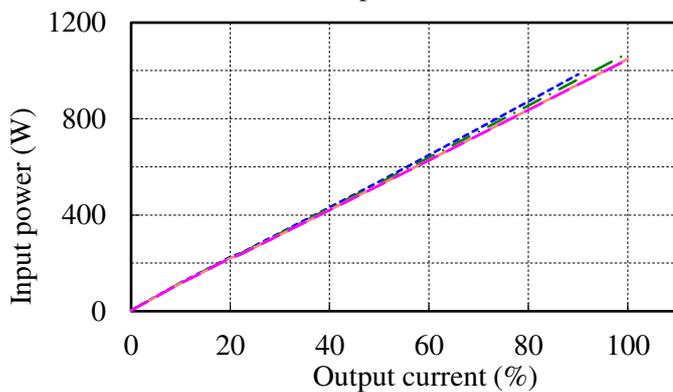
12V

Vin	Input power	
	Iout : 0%	Remote OFF
85VAC	4.2W	0.30W
115VAC	3.8W	0.34W
230VAC	2.9W	0.60W
265VAC	2.8W	0.71W



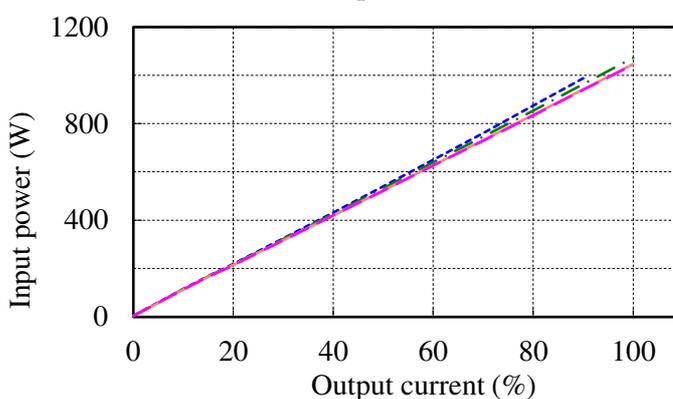
24V

Vin	Input power	
	Iout : 0%	Remote OFF
85VAC	4.3W	0.30W
115VAC	4.1W	0.34W
230VAC	3.1W	0.60W
265VAC	3.1W	0.71W



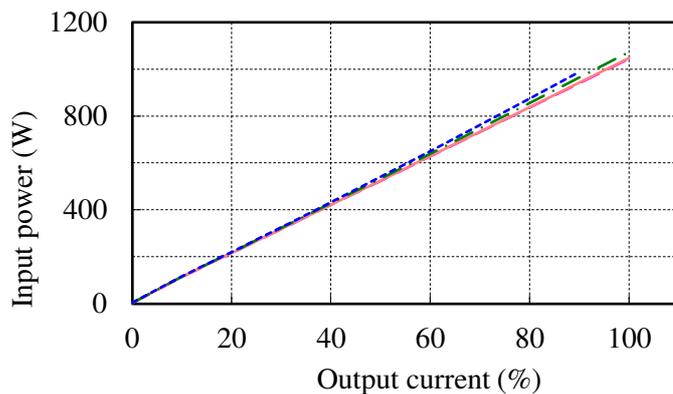
36V

Vin	Input power	
	Iout : 0%	Remote OFF
85VAC	4.5W	0.30W
115VAC	4.1W	0.34W
230VAC	3.4W	0.60W
265VAC	3.9W	0.71W



48V

Vin	Input power	
	Iout : 0%	Remote OFF
85VAC	4.6W	0.30W
115VAC	4.2W	0.34W
230VAC	3.4W	0.60W
265VAC	3.4W	0.71W



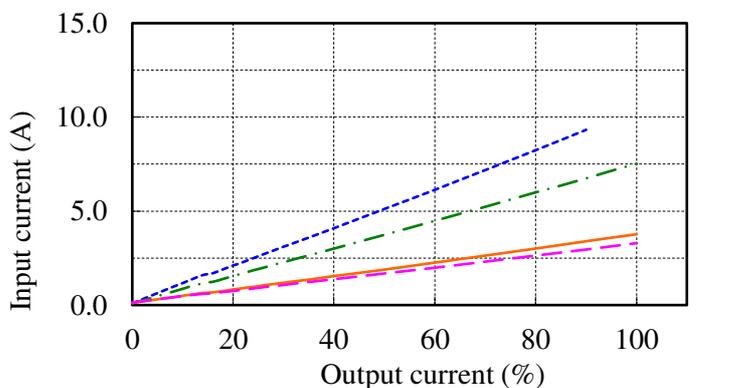
(4) 入力電流対出力電流

Input current vs. Output current

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

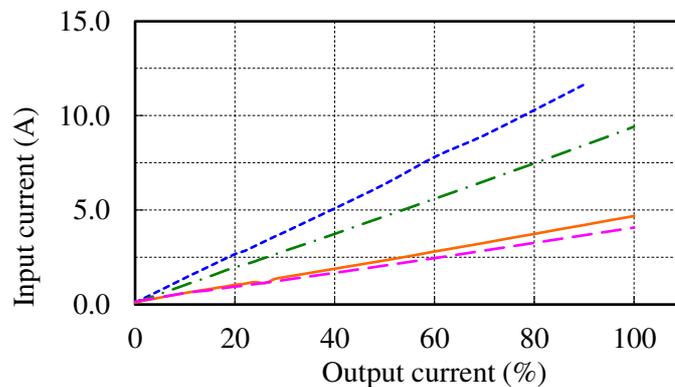
12V

Vin	Input current	
	Iout : 0%	Remote OFF
85VAC	0.09A	0.05A
115VAC	0.09A	0.07A
230VAC	0.12A	0.10A
265VAC	0.14A	0.12A



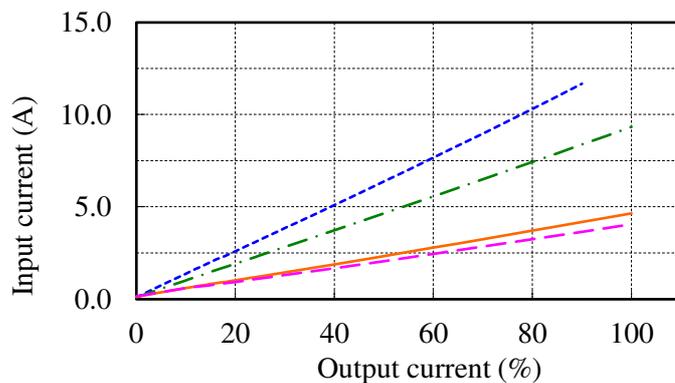
24V

Vin	Input current	
	Iout : 0%	Remote OFF
85VAC	0.10A	0.05A
115VAC	0.09A	0.07A
230VAC	0.12A	0.10A
265VAC	0.15A	0.12A



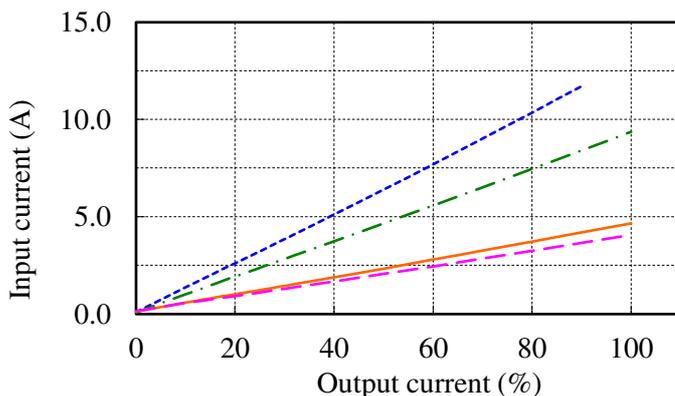
36V

Vin	Input current	
	Iout : 0%	Remote OFF
85VAC	0.10A	0.05A
115VAC	0.09A	0.07A
230VAC	0.12A	0.10A
265VAC	0.15A	0.12A



48V

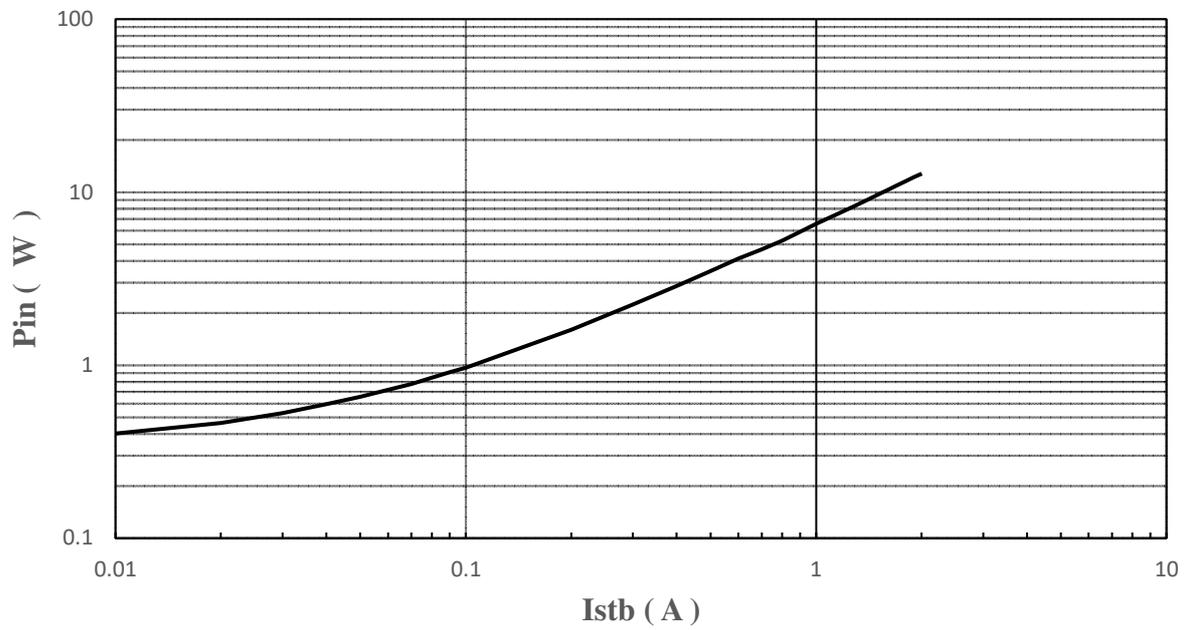
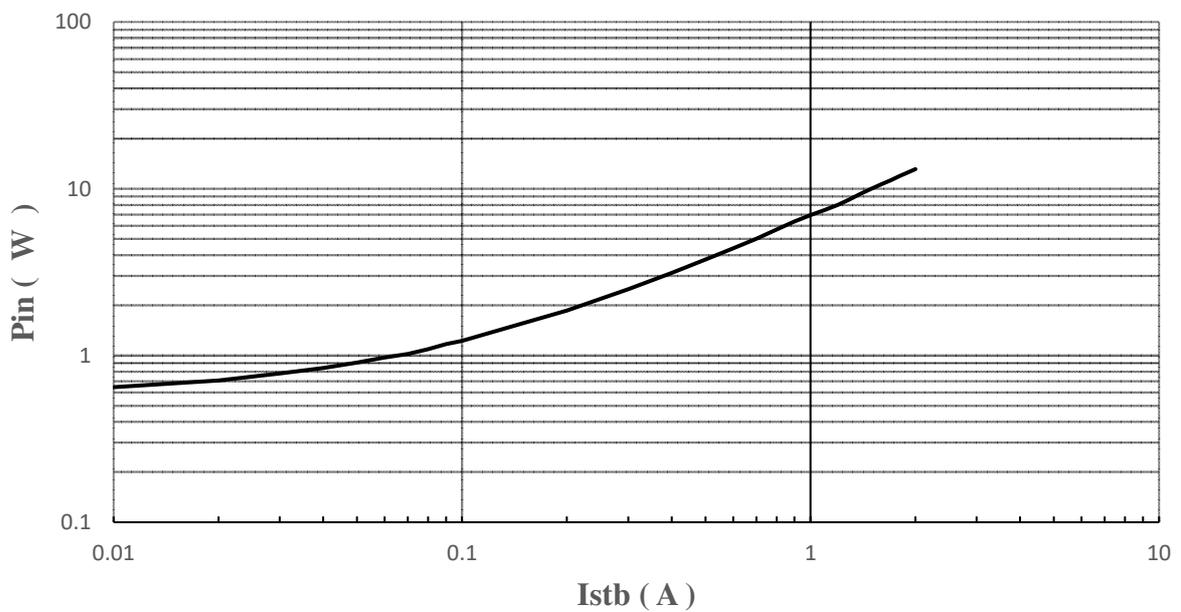
Vin	Input current	
	Iout : 0%	Remote OFF
85VAC	0.10A	0.05A
115VAC	0.09A	0.07A
230VAC	0.13A	0.10A
265VAC	0.15A	0.12A



(5) リモートOFF時入力電力対出力電流 (Istb)

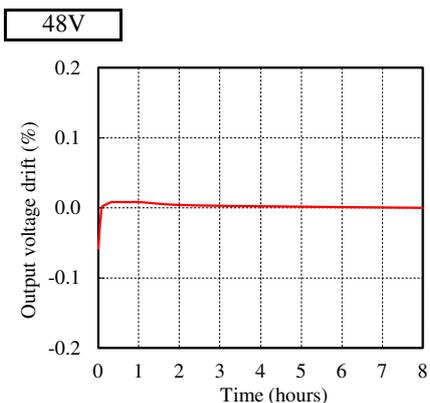
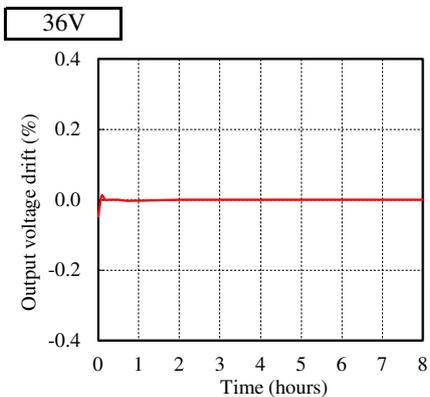
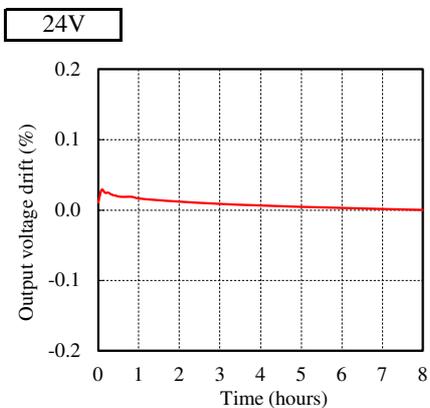
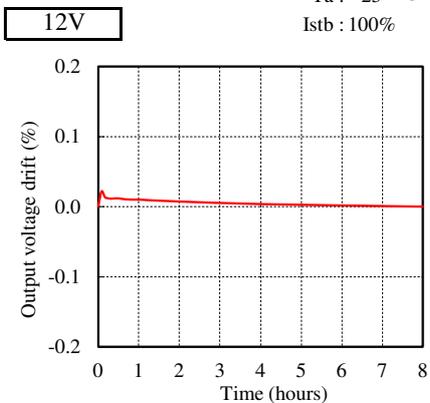
Input power vs. Output current @ Remote OFF

Condition : Remote OFF

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

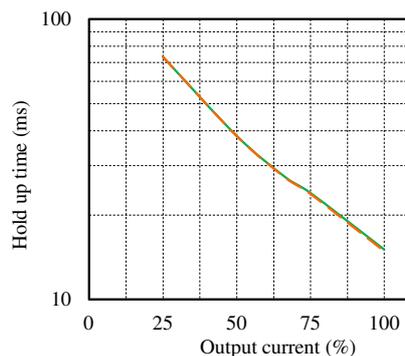
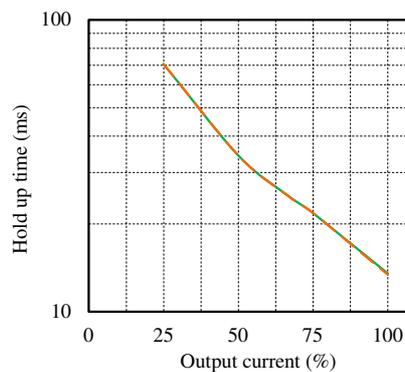
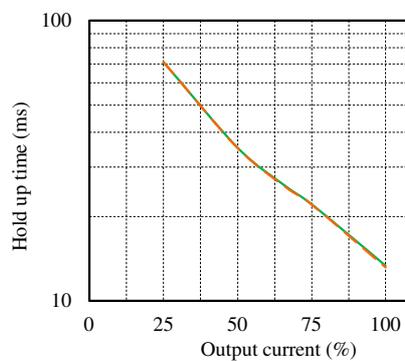
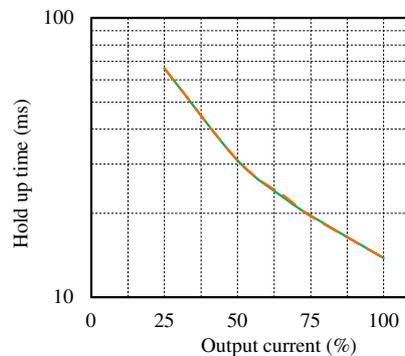
2-2. 通電ドリフト特性
Warm up voltage drift characteristics

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



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

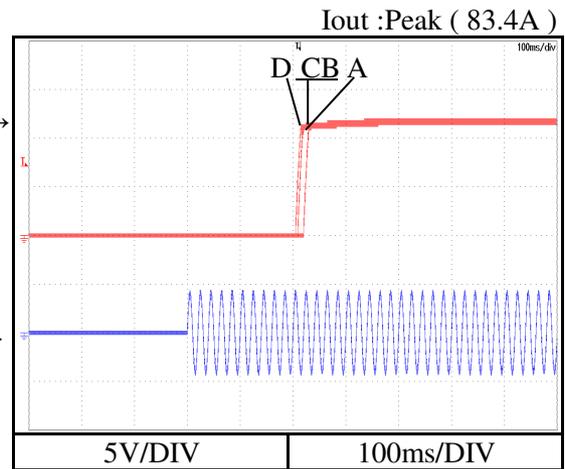
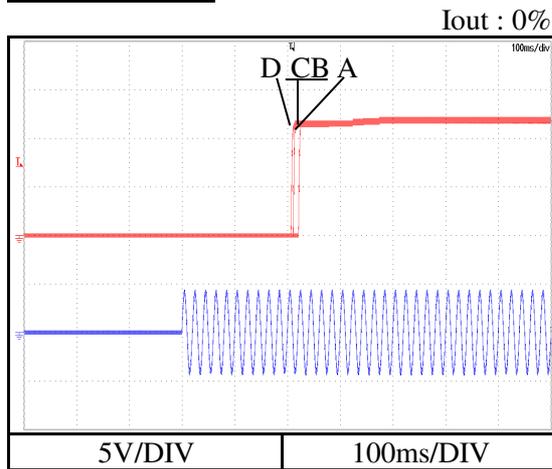
Conditions Vin : 115 VAC
230 VAC
Ta : 25 °C
Istb : 100%



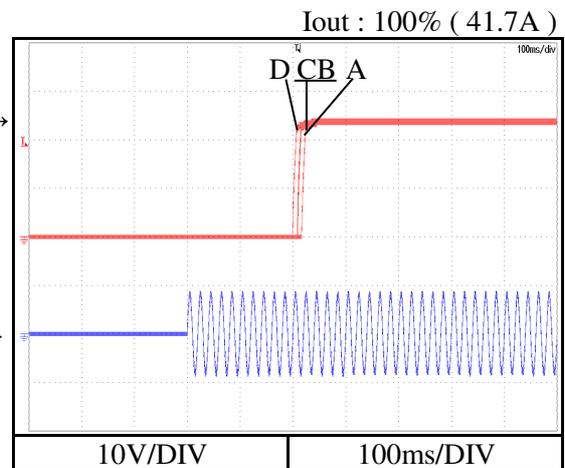
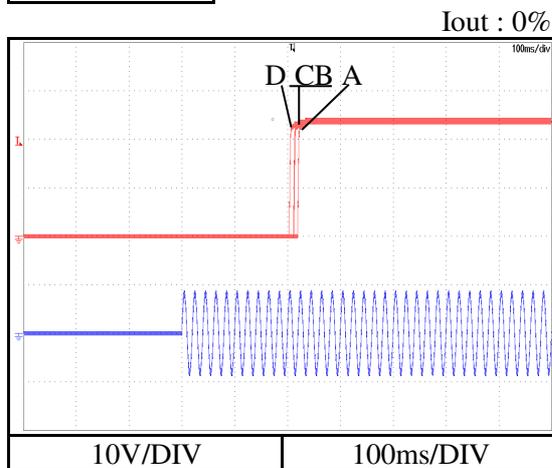
2-4. 出力立ち上がり特性
Output rise characteristics

Conditions V_{in} : 85 VAC (A)
115 VAC (B)
230 VAC (C)
265 VAC (D)
 I_{stb} : 100 %
 T_a : 25 °C

12V

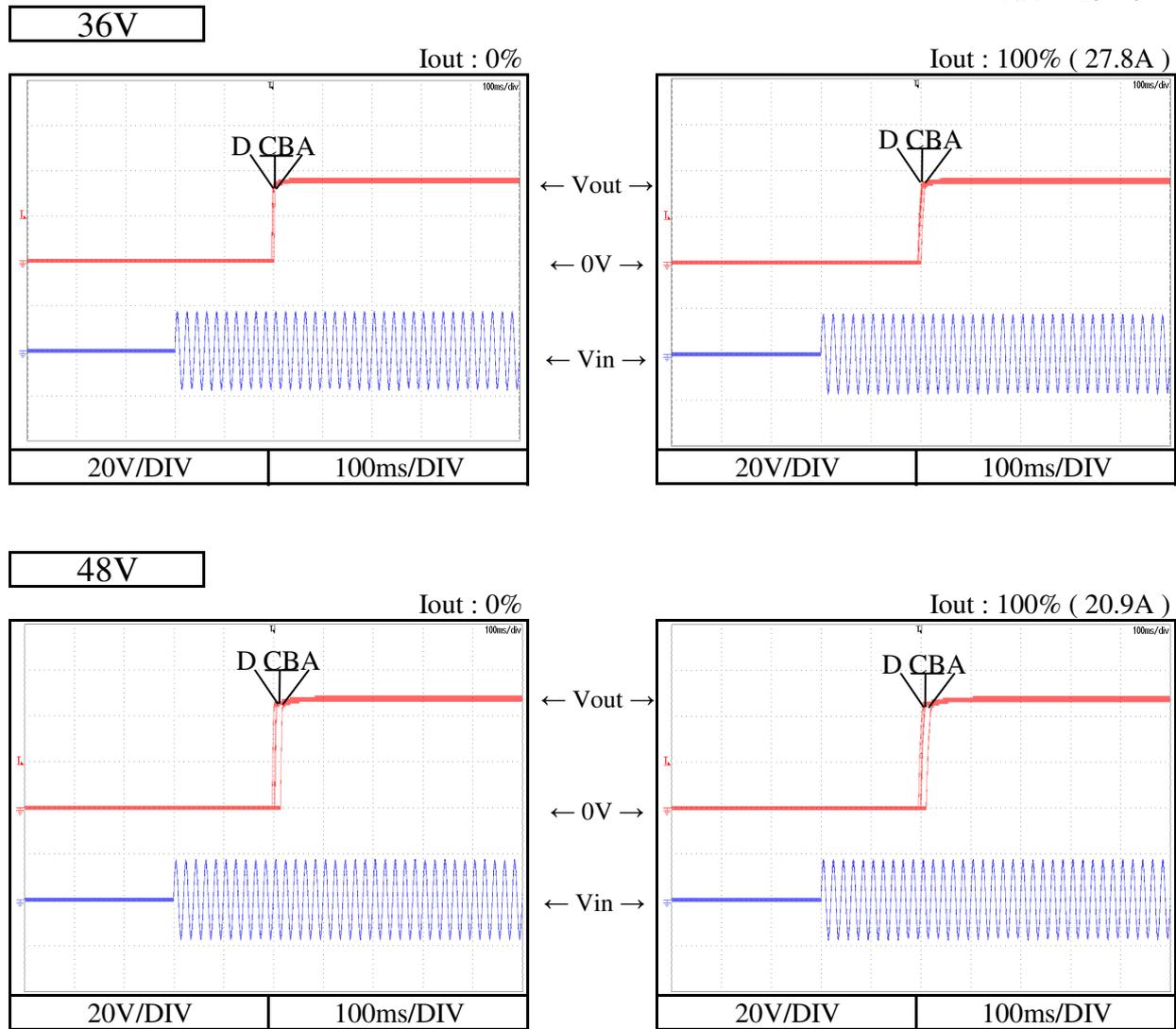


24V



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

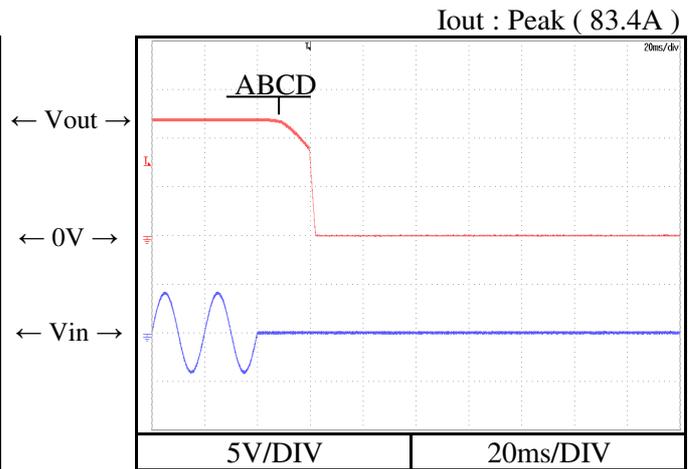
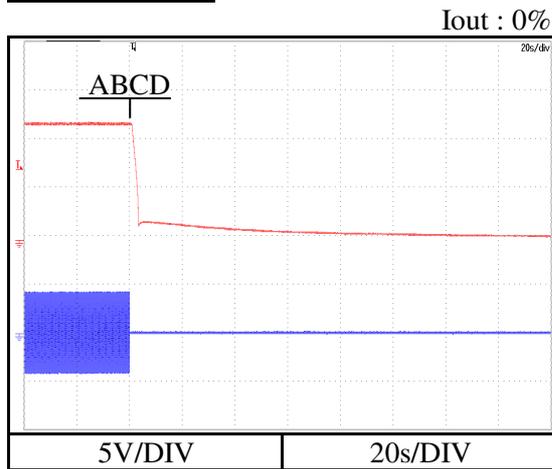
Conditions Vin : 85 VAC (A)
115 VAC (B)
230 VAC (C)
265 VAC (D)
Istb : 100 %
Ta : 25 °C



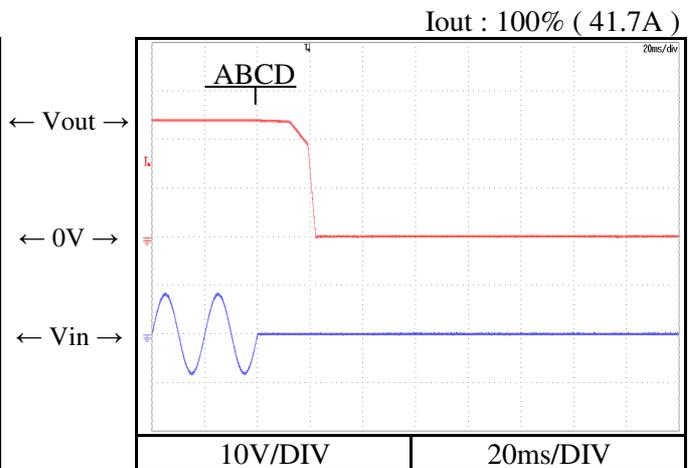
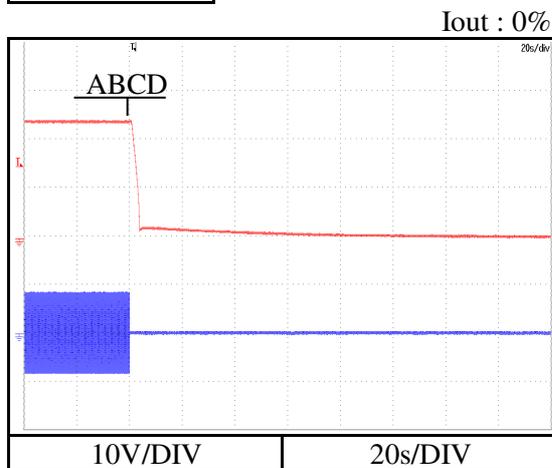
2-5. 出力立ち下がり特性
Output fall characteristics

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

12V



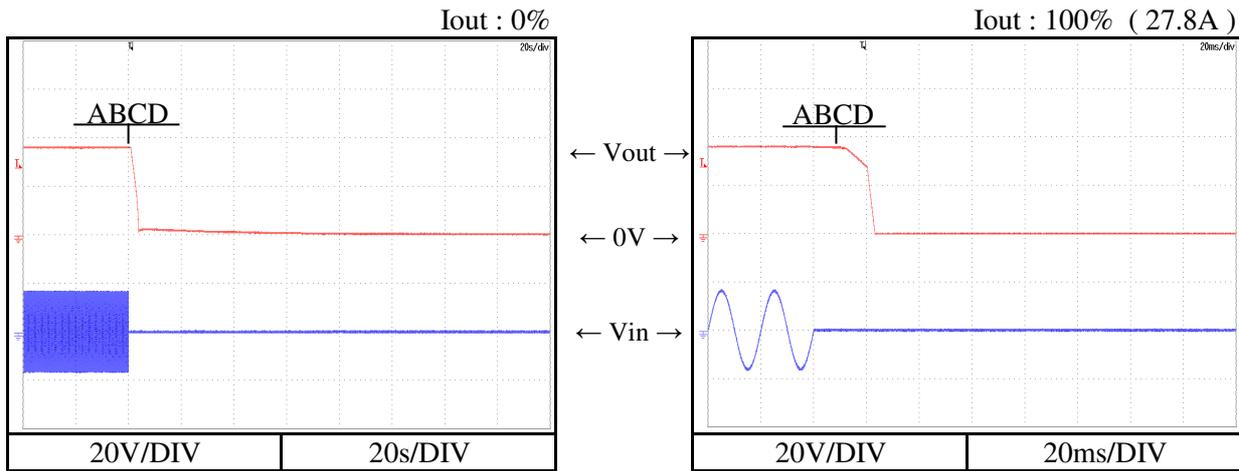
24V



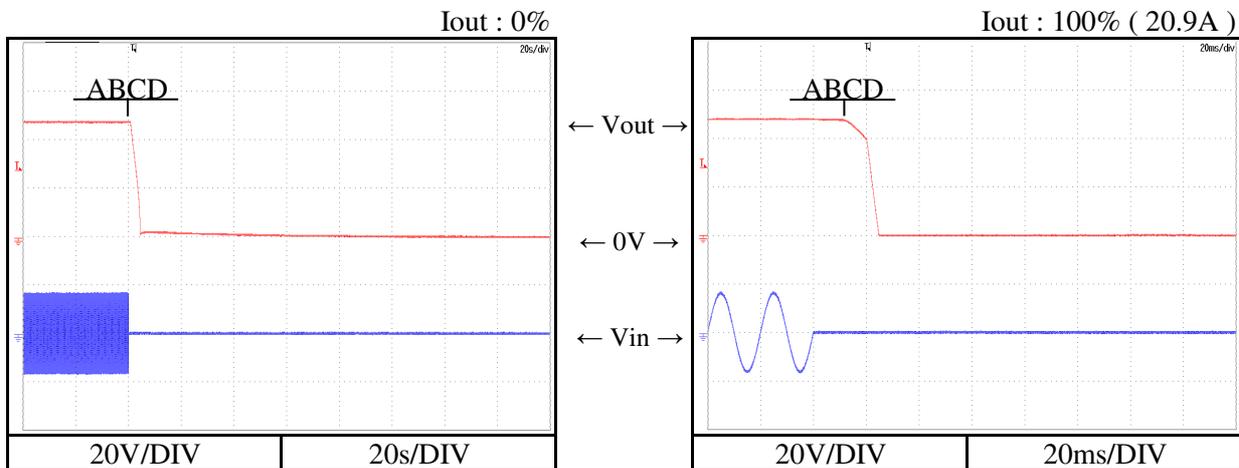
2-5. 出力立ち下がり特性
Output fall characteristics

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 %

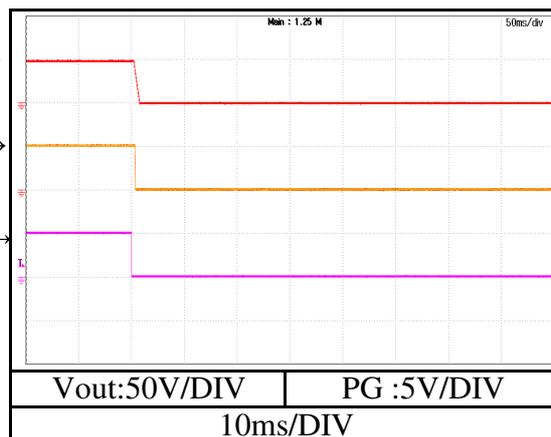
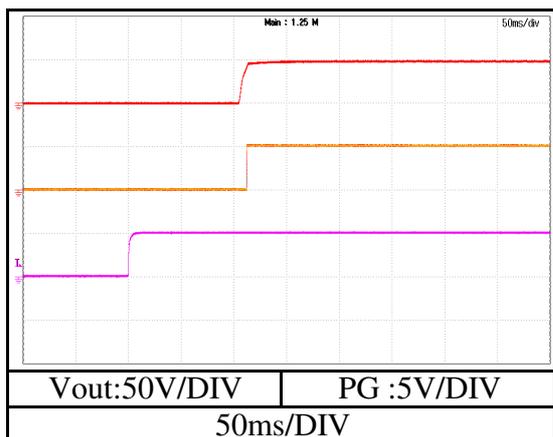
Istb : 100 %

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

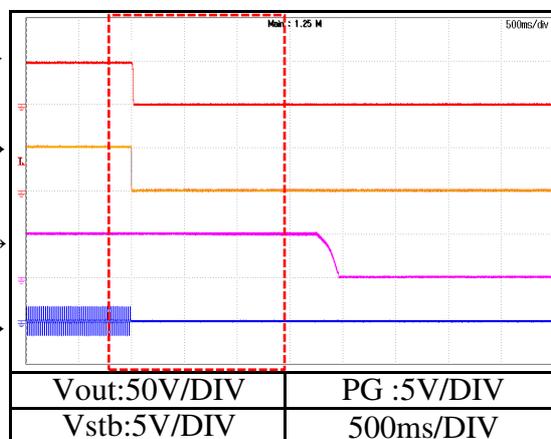
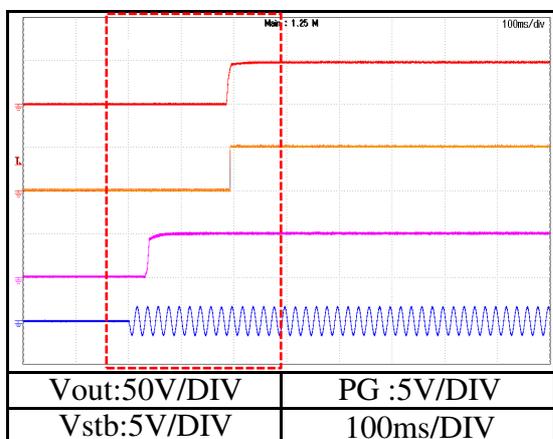
Output rise, fall characteristics with Remote ON/OFF Control

48V



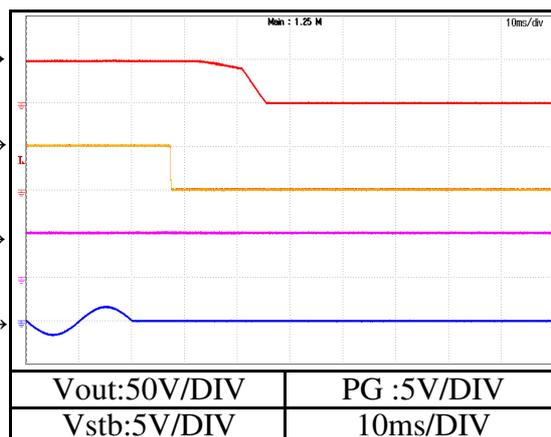
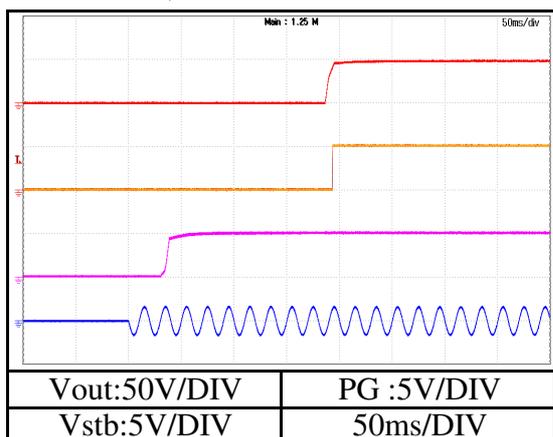
入力電圧ON/OFFによる出力立ち上がり、立ち下がり特性

Output rise, fall characteristics with Input voltage ON/OFF



Zoom

Zoom

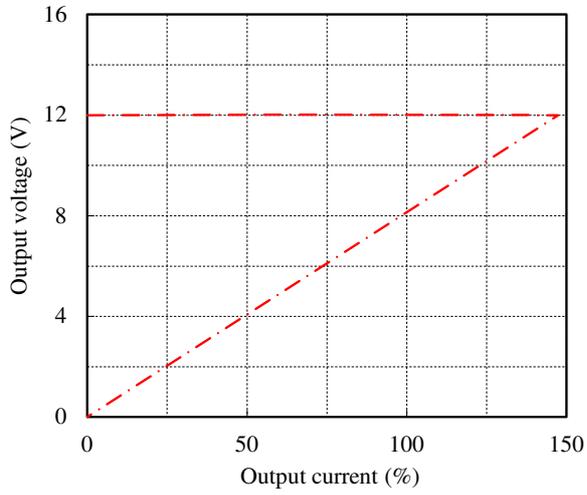


2-7. 過電流保護特性

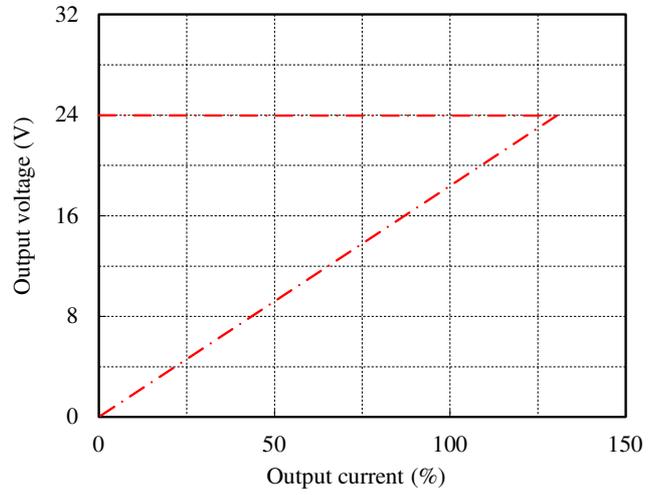
Over current protection (OCP) characteristics

Conditions V_{in} : 115 VAC
 I_{stb} : 100 %
 T_a : 25 °C

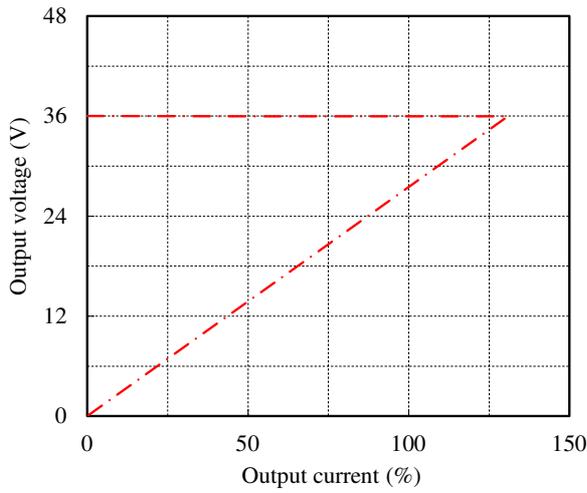
12V



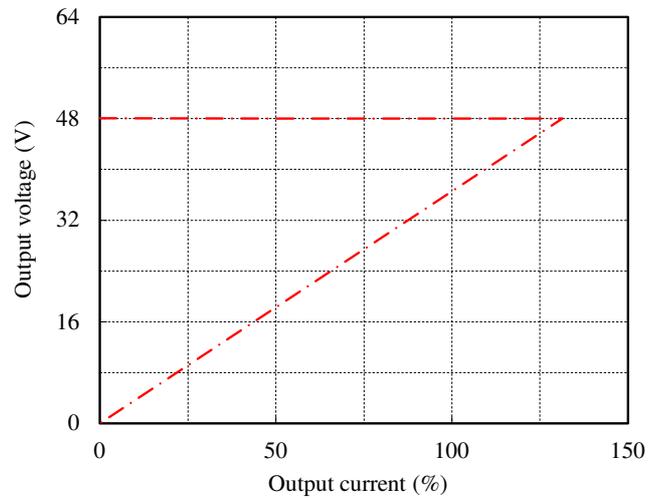
24V



36V



48V

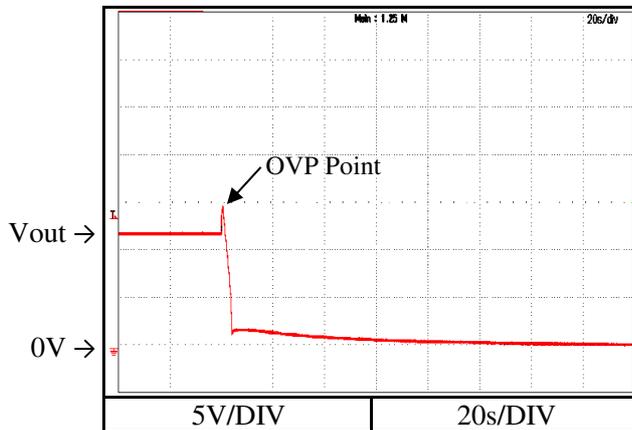


2-8. 過電圧保護特性

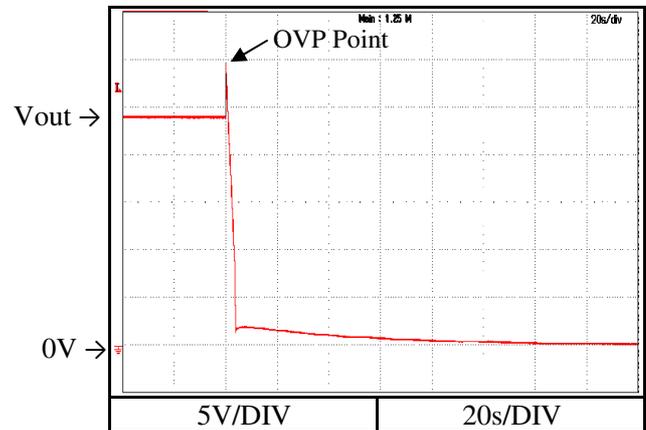
Over voltage protection (OVP) characteristics

Conditions V_{in} : 115 VAC I_{out} : 0 % I_{stb} : 0 % T_a : 25 °C

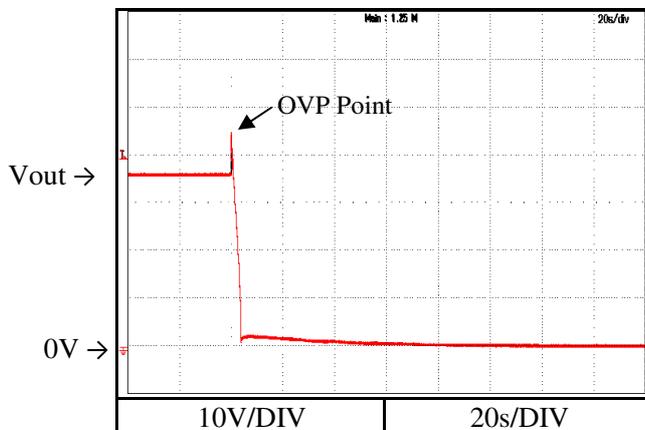
12V



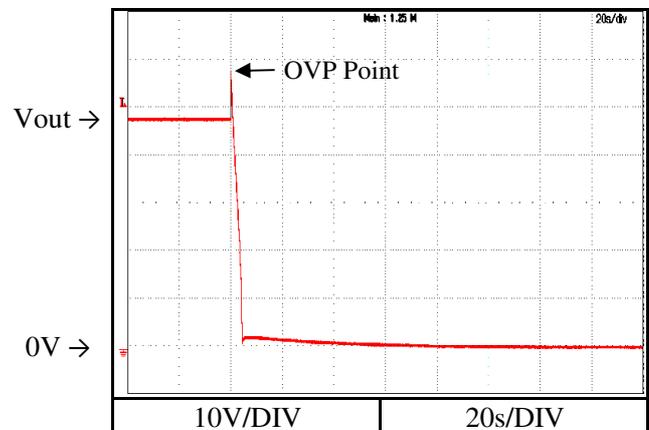
24V



36V



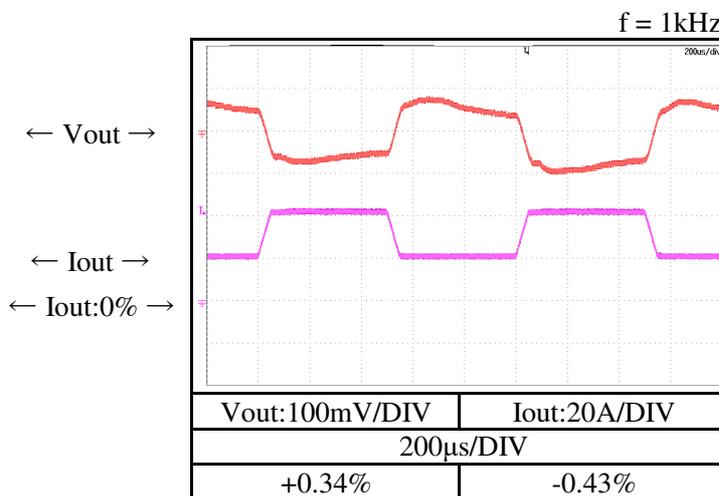
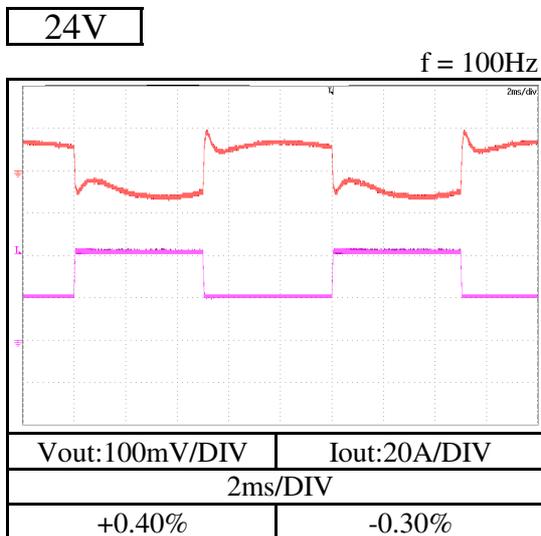
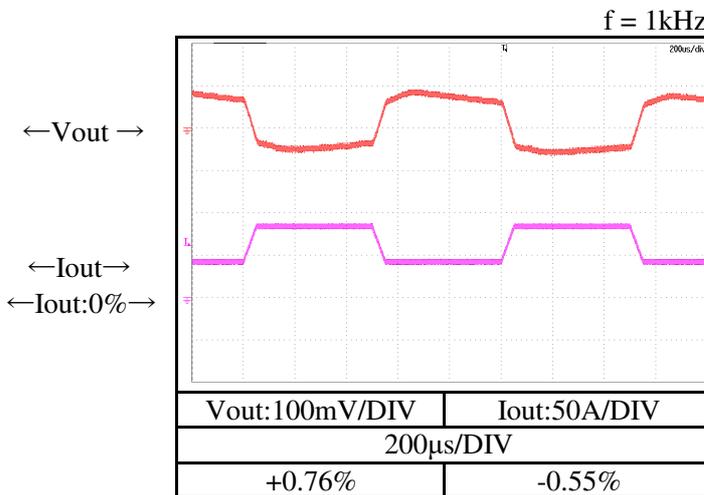
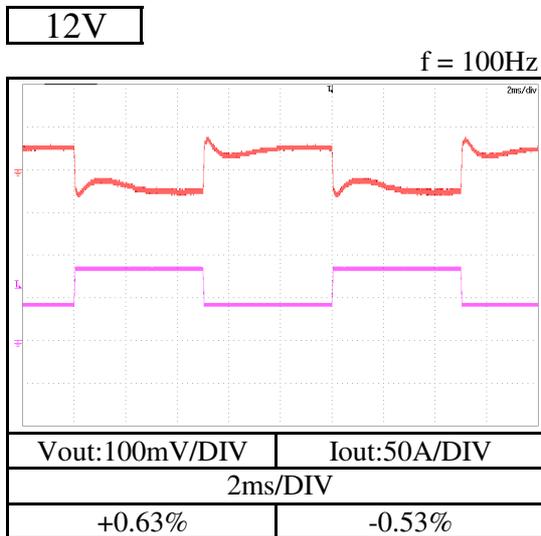
48V



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

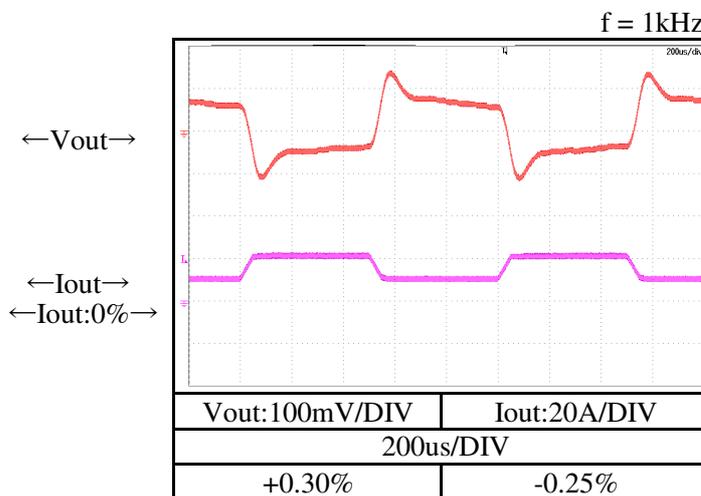
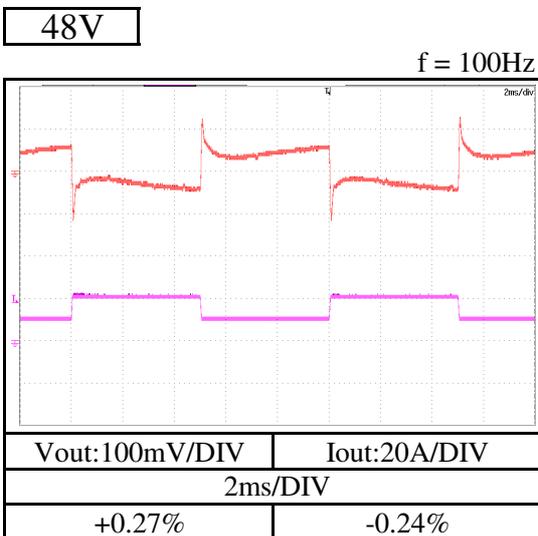
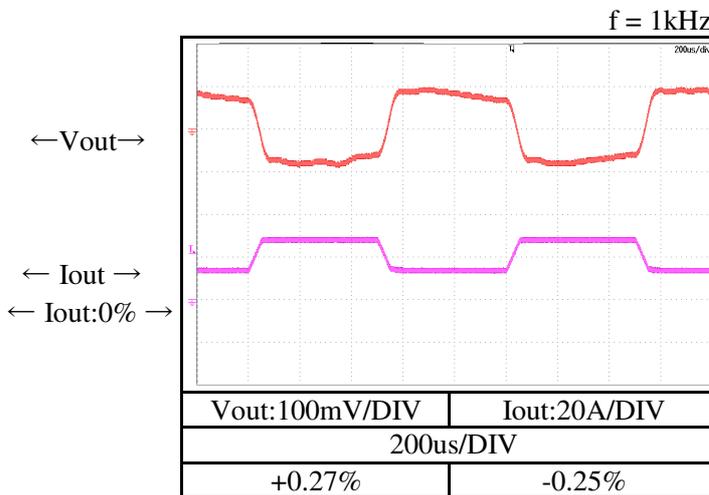
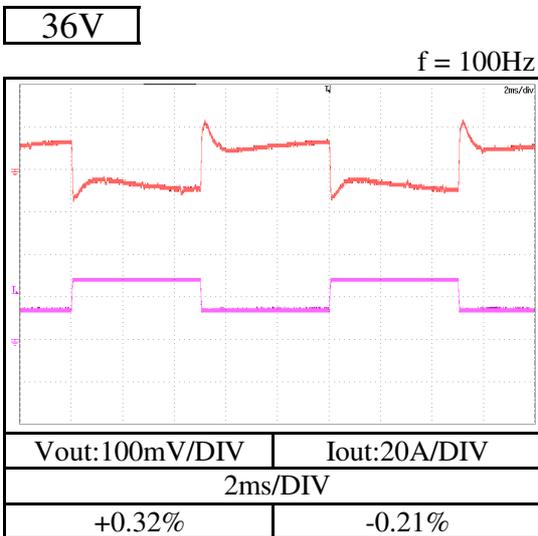


Conditions Vin : 115 VAC
 Iout : 50 % ↔ 100 %
 (tr = tf = 50us)
 Istb : 100 %
 Ta : 25 °C

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



2-10. 入力電圧瞬停特性

Response to brown out characteristics

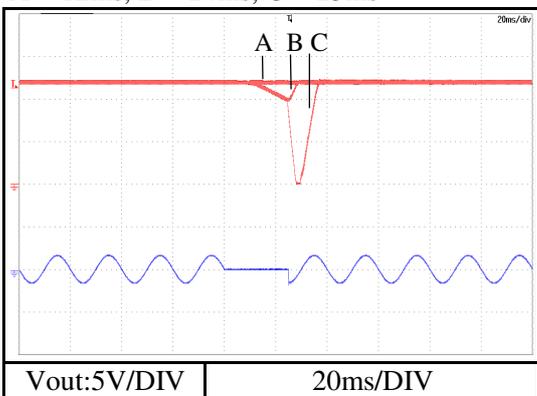
Conditions Iout : 100 %
 Istb : 100 %
 Ta : 25 °C

瞬停時間 Interruption time

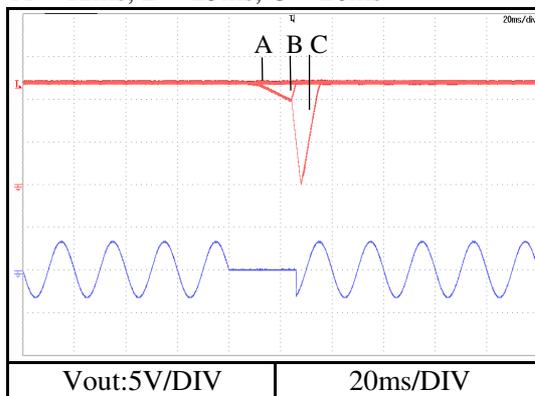
- A : 出力電圧の低下なし Output voltage does not drop.
- B : 出力電圧の低下が定格出力電圧の20~40%までいかない
 Output voltage drop down to 20~40% of the nominal output voltage.
- C : 出力電圧が0Vまで低下 Output voltage drops until 0V.

12V

Vin : 115VAC
 A = 12ms, B = 24ms, C = 25ms

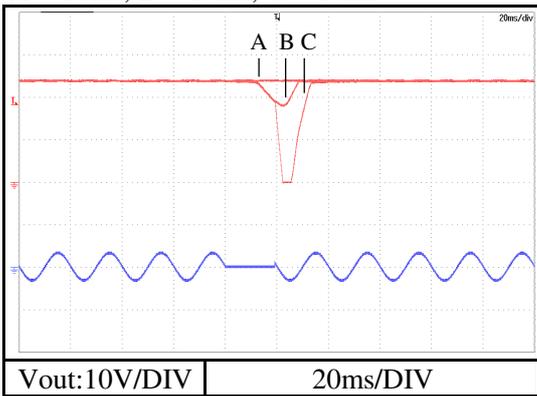


Vin : 230VAC
 A = 12ms, B = 25ms, C = 26ms

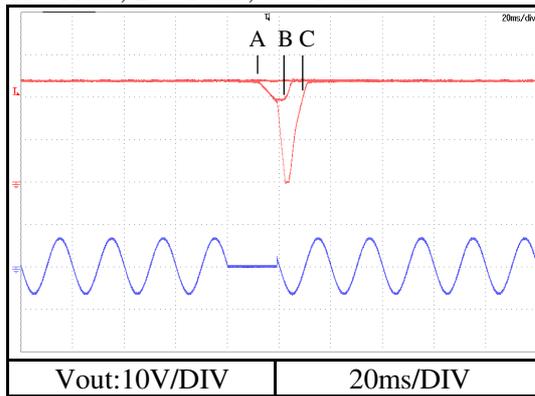


24V

Vin : 115VAC
 A = 11ms, B = 18ms, C = 19ms



Vin : 230VAC
 A = 11ms, B = 18ms, C = 19ms



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

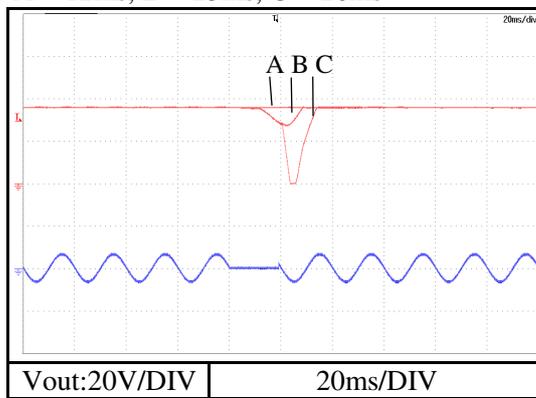
Output voltage drop down to 20~40% of the nominal output voltage.

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

36V

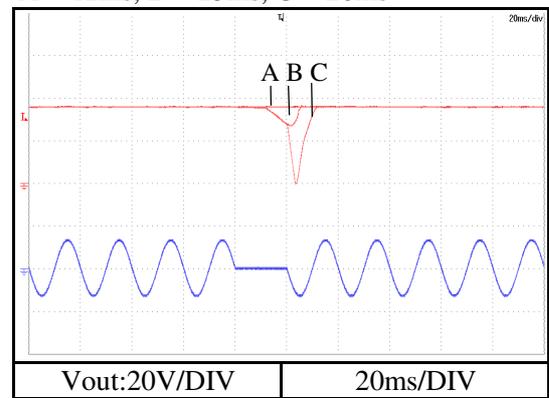
Vin : 115VAC

A = 12ms, B = 25ms, C = 26ms



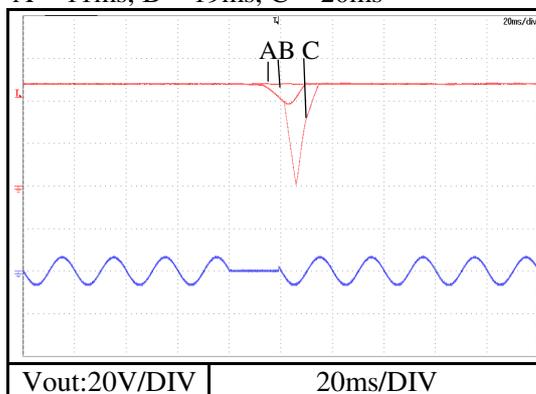
Vin : 230VAC

A = 12ms, B = 25ms, C = 26ms

**48V**

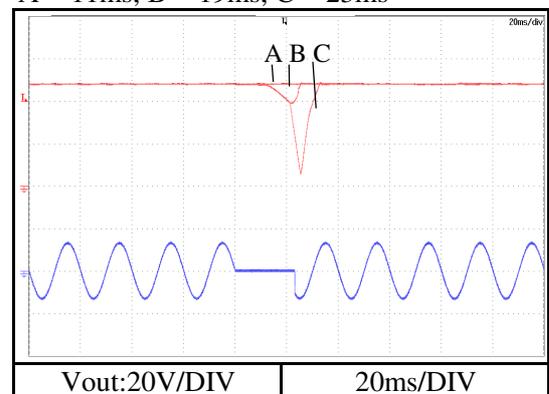
Vin : 115VAC

A = 11ms, B = 19ms, C = 20ms



Vin : 230VAC

A = 11ms, B = 19ms, C = 23ms

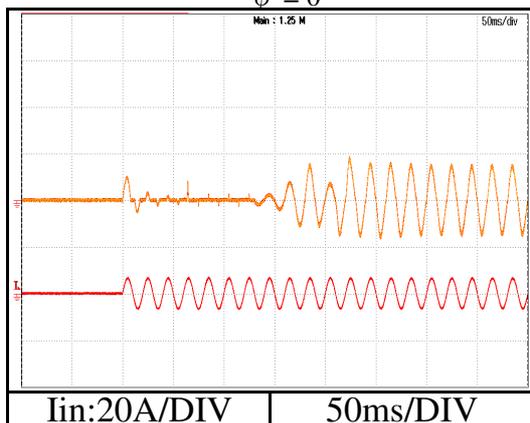


2-11. 入力サージ電流(突入電流)波形
Inrush current waveform

Conditions Vin : 115 VAC
Iout : 100 % (20.9A)
Istb : 100 %
Ta : 25 °C

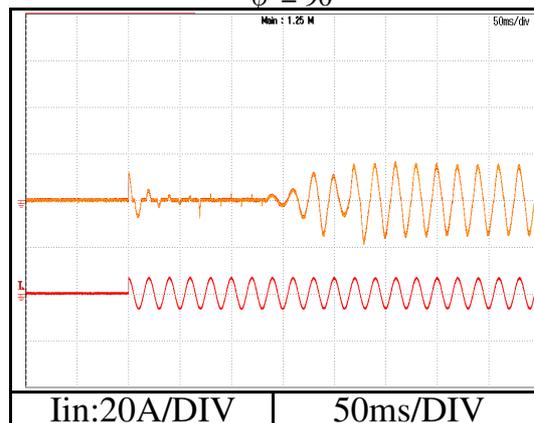
48V

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



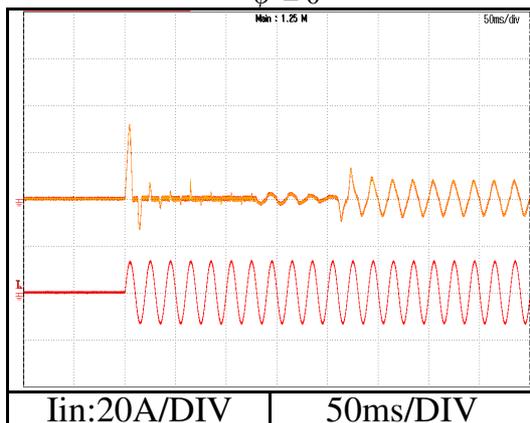
← Iin →
← Vin →

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



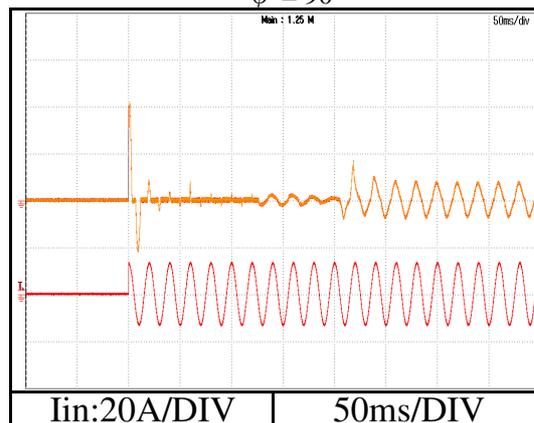
Conditions Vin : 230 VAC
Iout : 100 % (20.9A)
Istb : 100 %
Ta : 25 °C

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



← Iin →
← Vin →

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



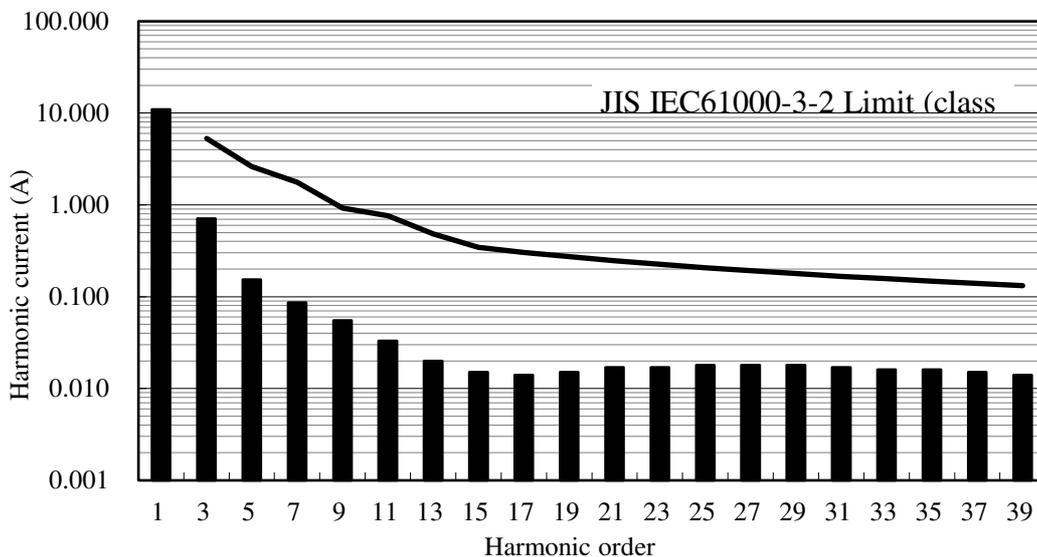
2-12. 高調波成分

Input current harmonics

Conditions

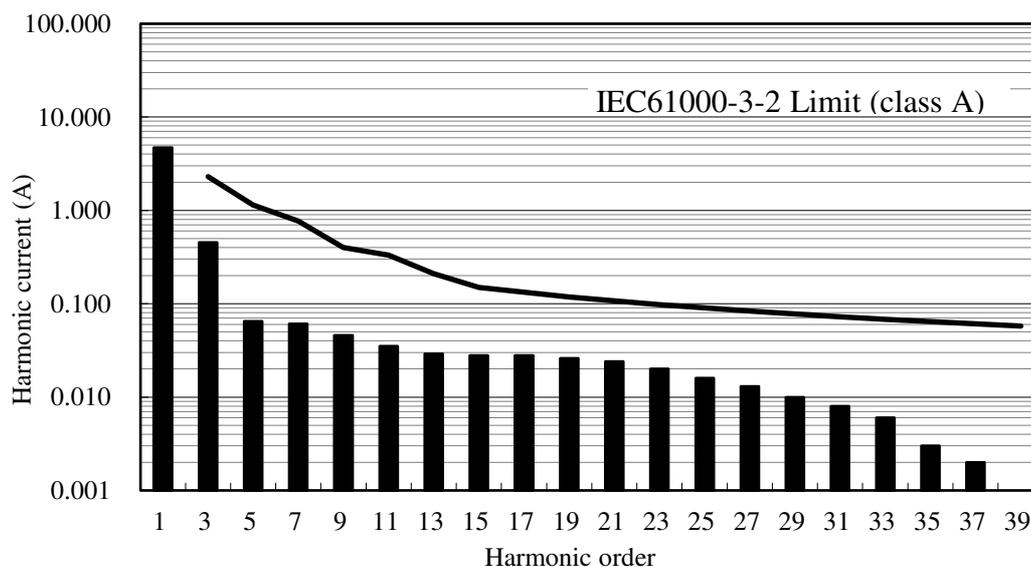
Vin : 100 VAC
 Iout : 20.9 A (100%)
 Istb : 100 %
 Ta : 25 °C

48V



Conditions

Vin : 230 VAC
 Iout : 20.9 A (100%)
 Istb : 100 %
 Ta : 25 °C

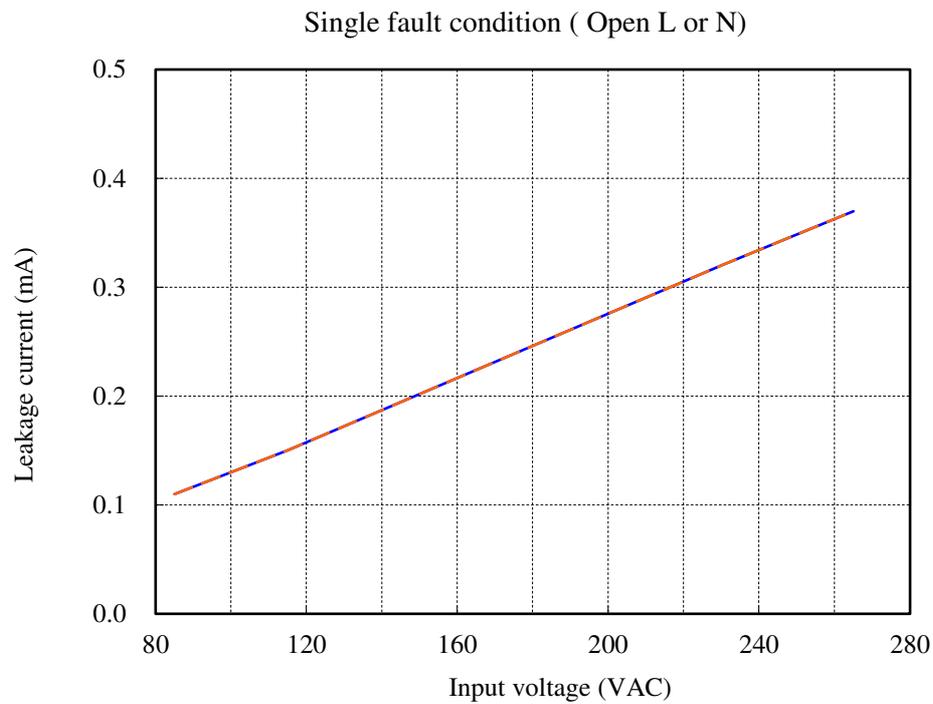
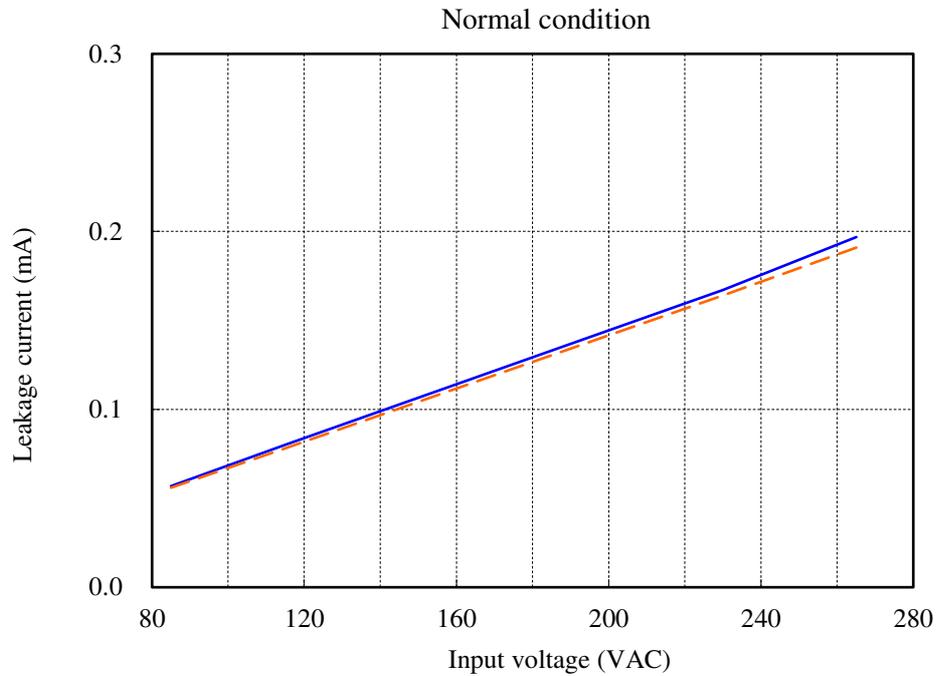


2-13. 漏洩電流特性

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 % ————
 100 % - - - - -
 Ta : 25 °C
 Istb : 100 %
 f : 60 Hz

48V

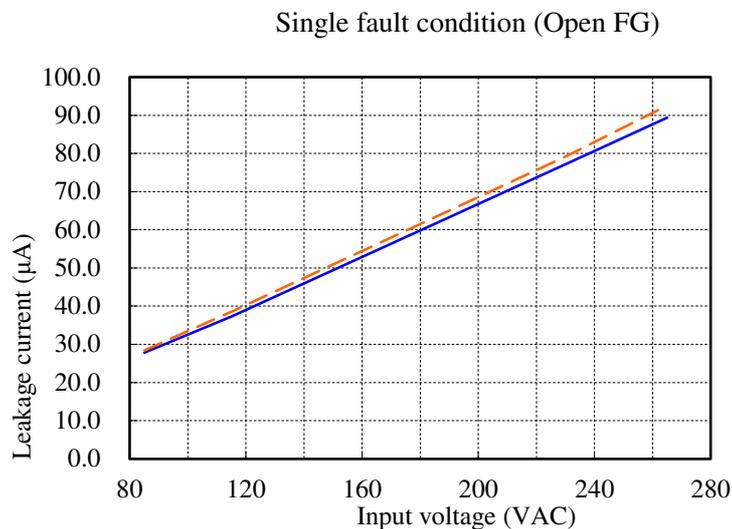
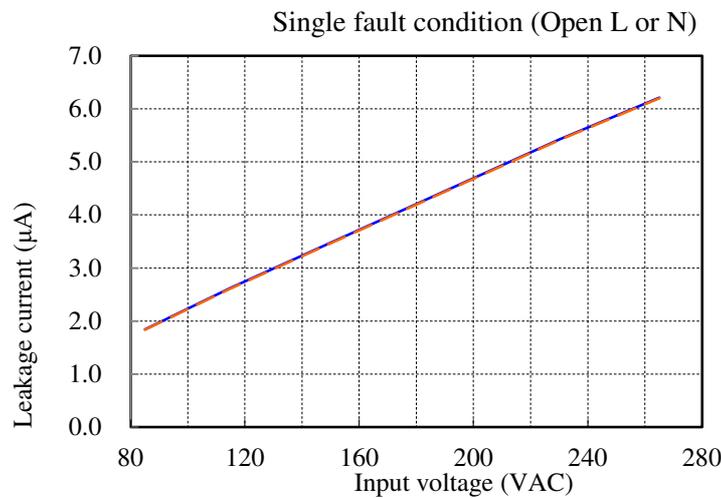
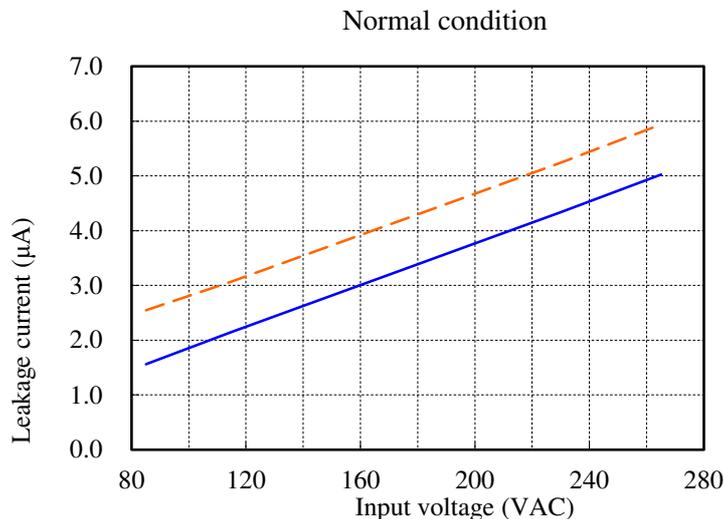


2-13. 漏洩電流特性

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 solid line)
 100 % - - - - - (orange dashed line)
 Ta : 25 °C
 Istb : 100 %
 f : 60 Hz

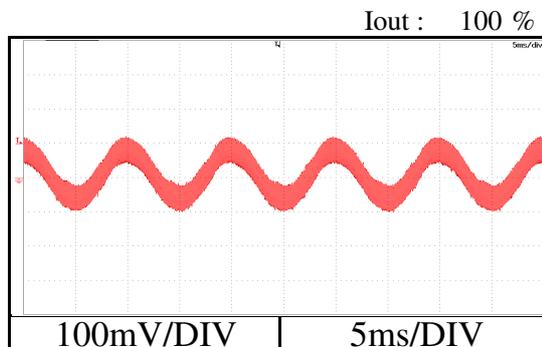
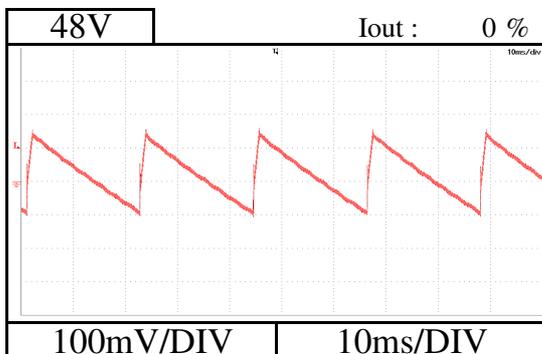
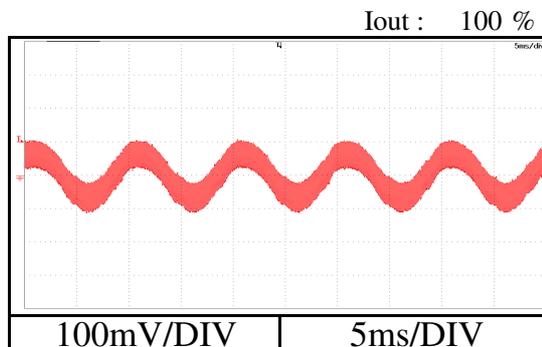
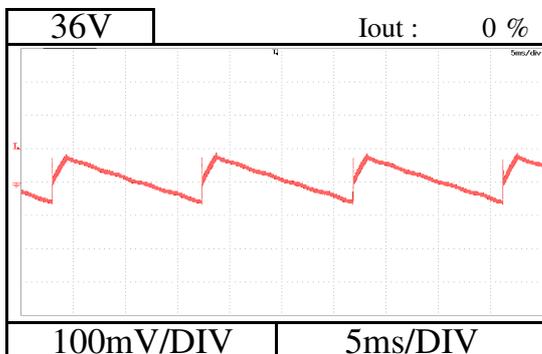
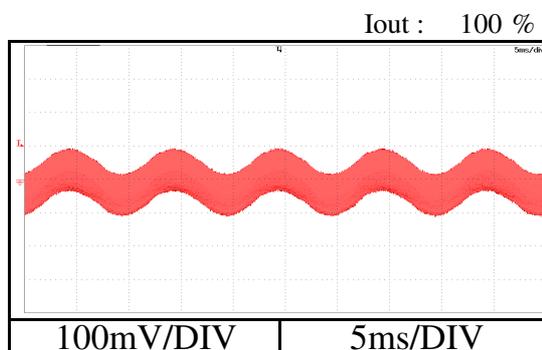
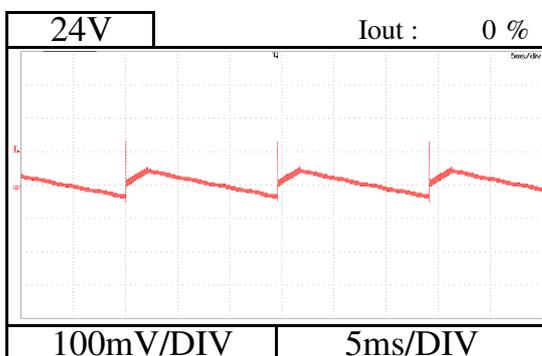
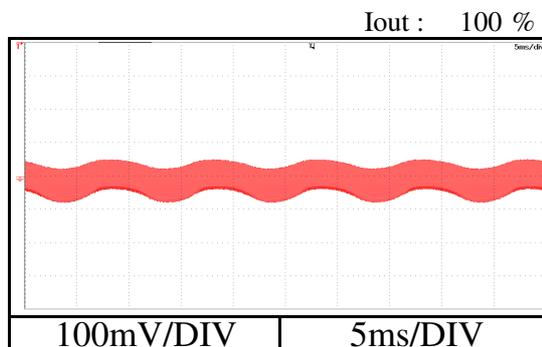
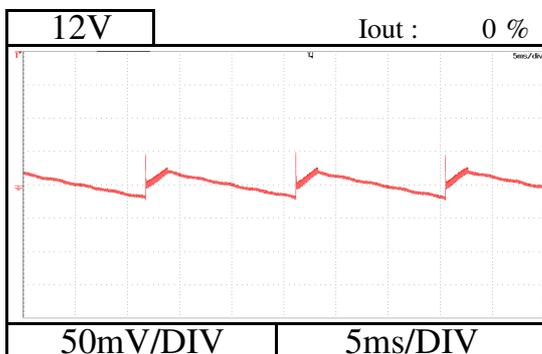
48V



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



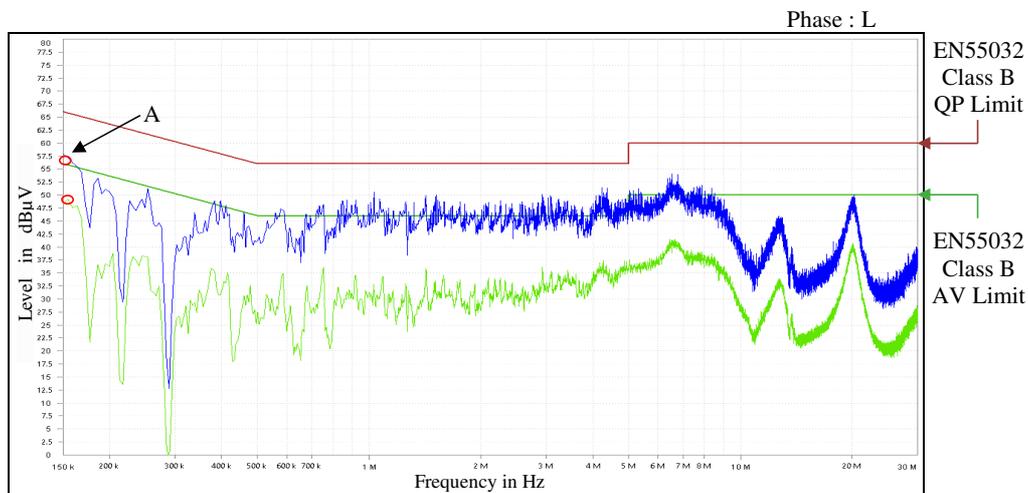
2-15. EMI特性

Electro-Magnetic Interference characteristics

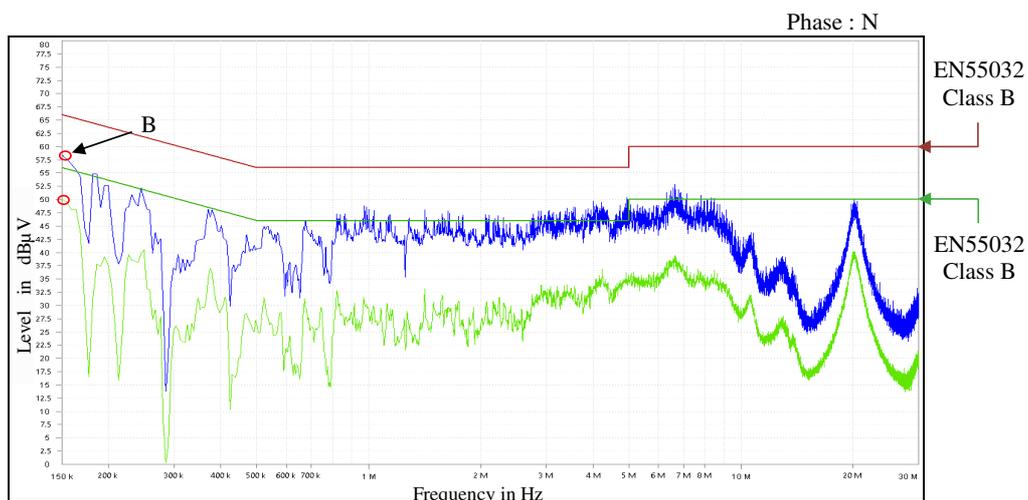
Conditions Vin : 115 VAC
 Iout : 66.7 A (100%)
 Istb : 100 %
 Ta : 25 °C

雑音端子電圧
 Conducted Emission
 12V

Point A (155kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	65.8	56.8
AV	55.8	49.1



Point B (150kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	66.0	57.8
AV	56.0	49.7



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.

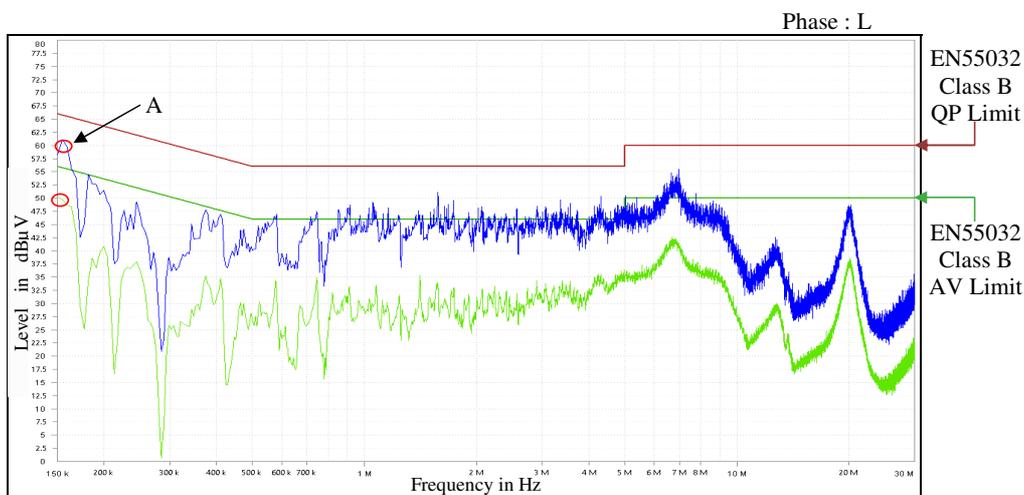
2-15. EMI特性

Electro-Magnetic Interference characteristics

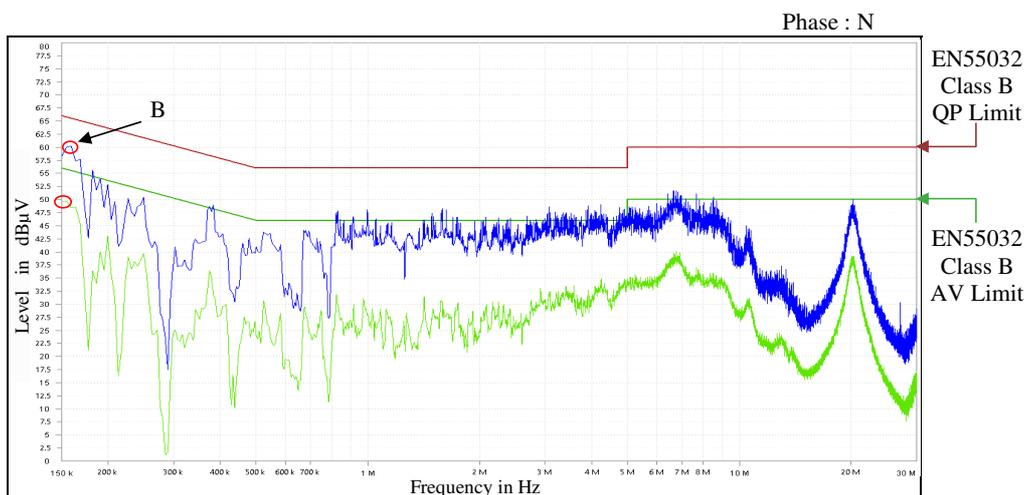
Conditions Vin : 230 VAC
 Iout : 66.7 A (100%)
 Istb : 100 %
 Ta : 25 °C

雑音端子電圧
 Conducted Emission
 12V

Point A (155kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	65.8	59.4
AV	56.0	49.9



Point B (159kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	65.5	58.6
AV	55.8	49.5



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.

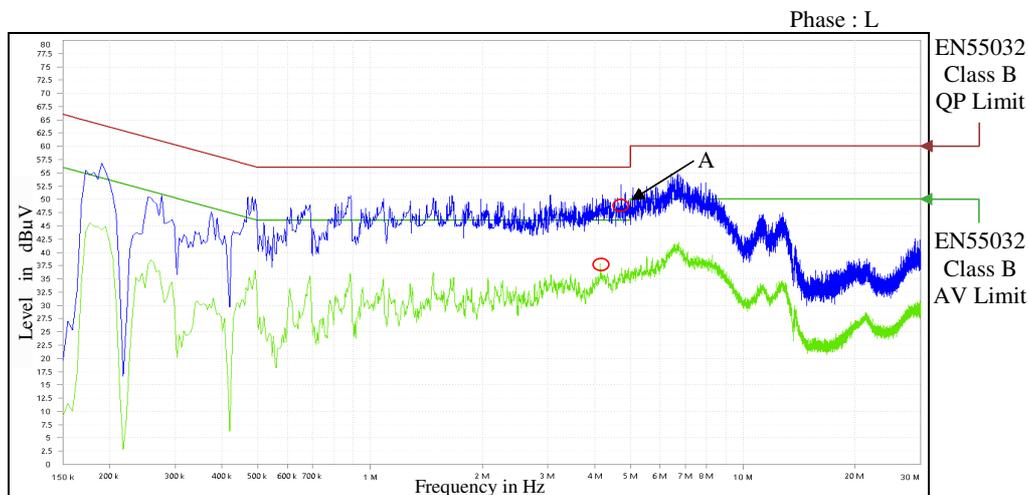
2-15. EMI特性

Electro-Magnetic Interference characteristics

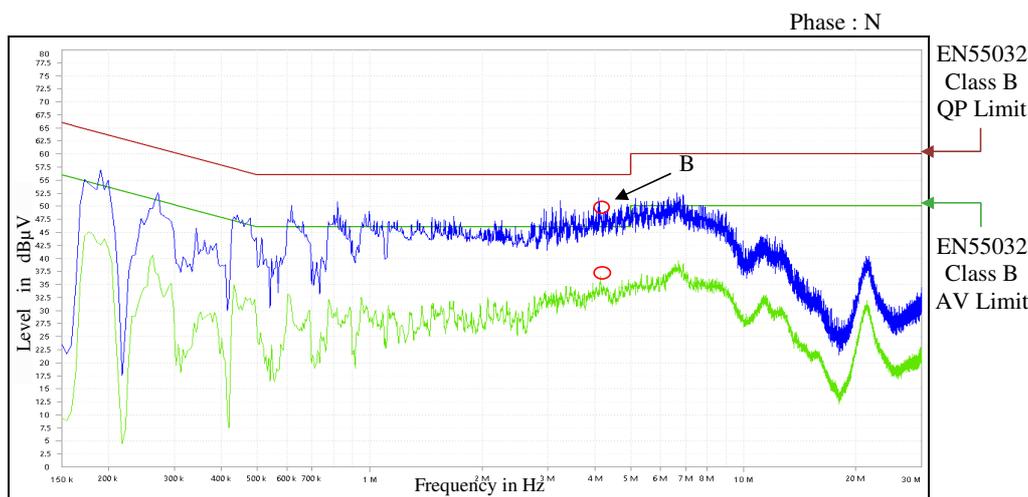
Conditions Vin : 115 VAC
 Iout : 41.7 A (100%)
 Istb : 100 %
 Ta : 25 °C

雑音端子電圧
 Conducted Emission
 24V

Point A (4.5MHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	56.0	47.3
AV	46.0	37.3



Point B (4.1MHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	56.0	47.0
AV	46.0	35.8



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.

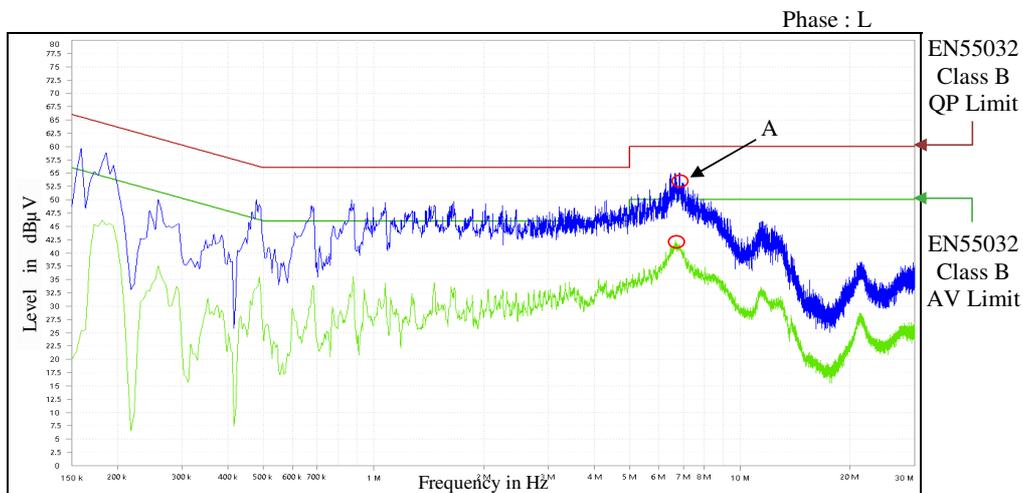
2-15. EMI特性

Electro-Magnetic Interference characteristics

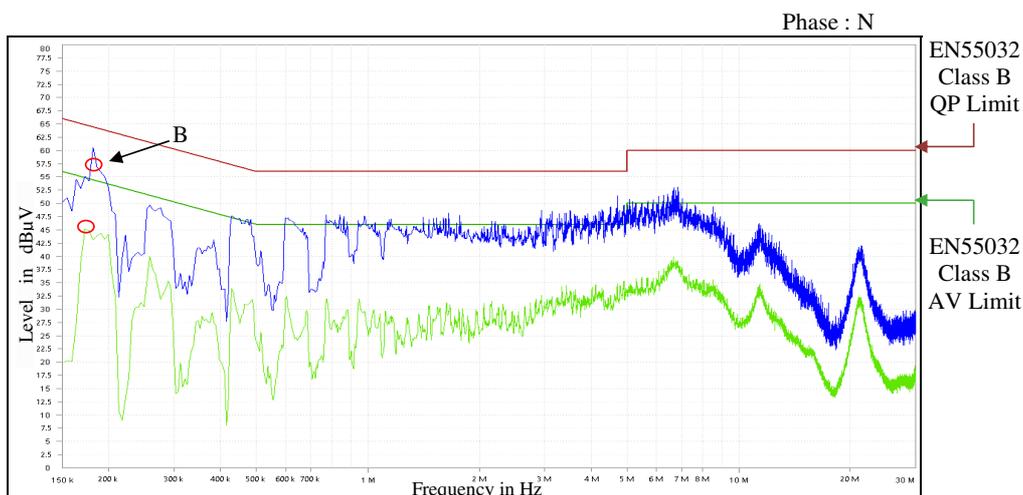
Conditions Vin : 230 VAC
 Iout : 41.7 A (100%)
 Istb : 100 %
 Ta : 25 °C

雑音端子電圧
 Conducted Emission
 24V

Ref. Data	Point A (6.8MHz)	
	Limit (dB)	Measure (dB)
QP	60.0	51.0
AV	50.0	41.5



Ref. Data	Point B (182KHz)	
	Limit (dB)	Measure (dB)
QP	64.4	55.6
AV	54.0	44.8



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

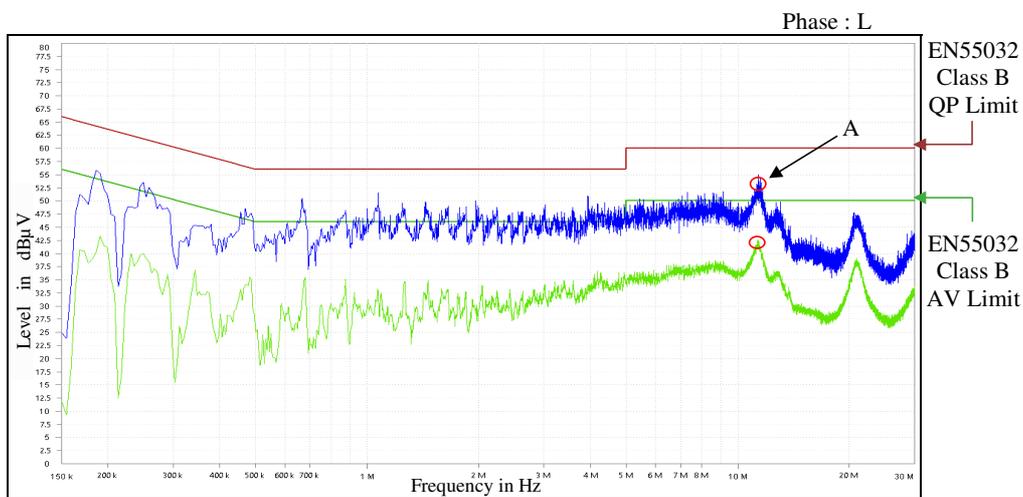
雑音端子電圧

Conducted Emission

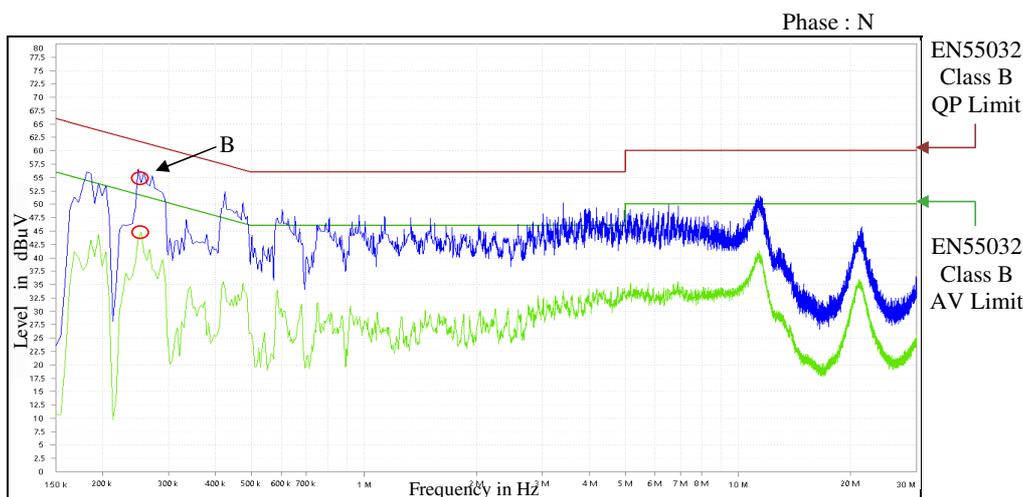
36V

Conditions Vin : 115 VAC
 Iout : 27.8 A (100%)
 Istb : 100 %
 Ta : 25 °C

Ref. Data	Point A (11MHz)	
	Limit (dB)	Measure (dB)
QP	60.0	50.9
AV	50.0	41.3



Ref. Data	Point B (249KHz)	
	Limit (dB)	Measure (dB)
QP	61.8	53.8
AV	51.6	43.9



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

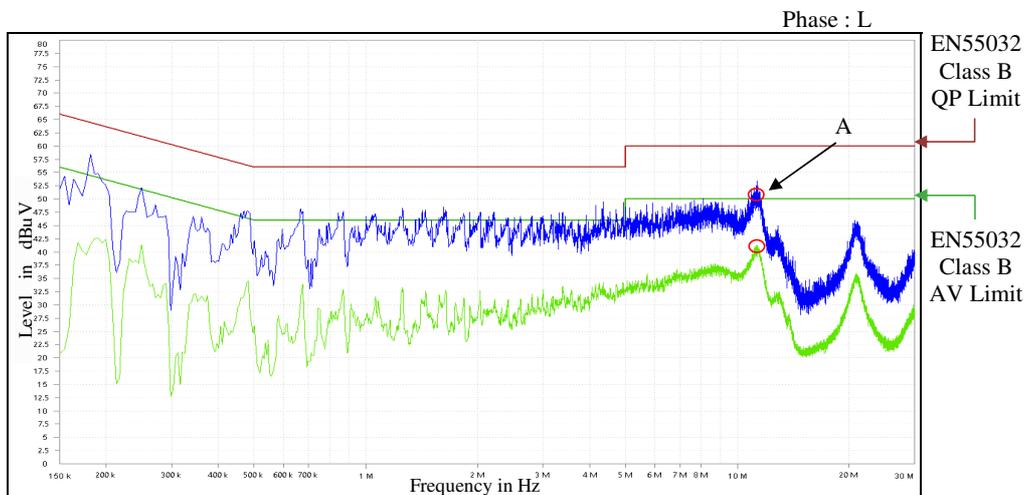
雑音端子電圧

Conducted Emission

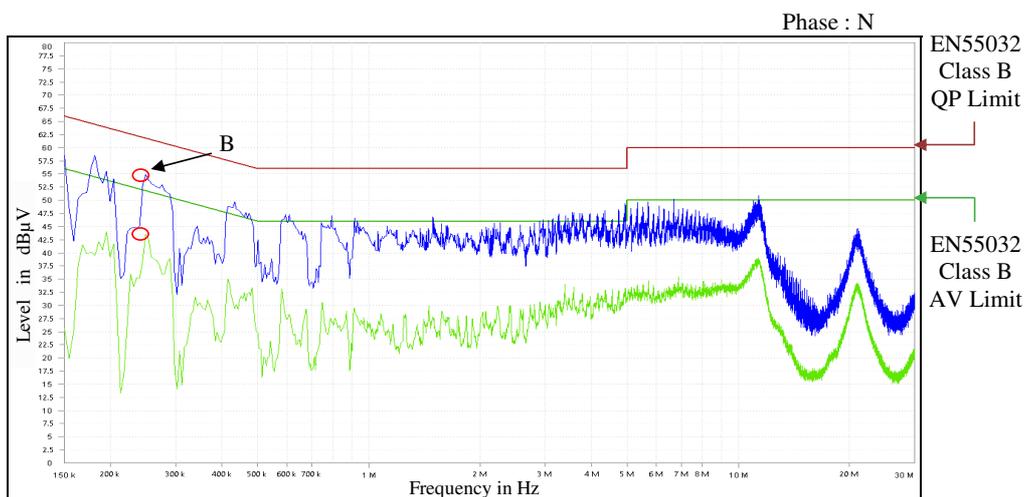
36V

Conditions Vin : 230 VAC
 Iout : 27.8 A (100%)
 Istb : 100 %
 Ta : 25 °C

Ref. Data	Point A (11MHz)	
	Limit (dB)	Measure (dB)
QP	60.0	50.3
AV	50.0	40.1



Ref. Data	Point B (249KHz)	
	Limit (dB)	Measure (dB)
QP	61.8	53.6
AV	51.8	43.0



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

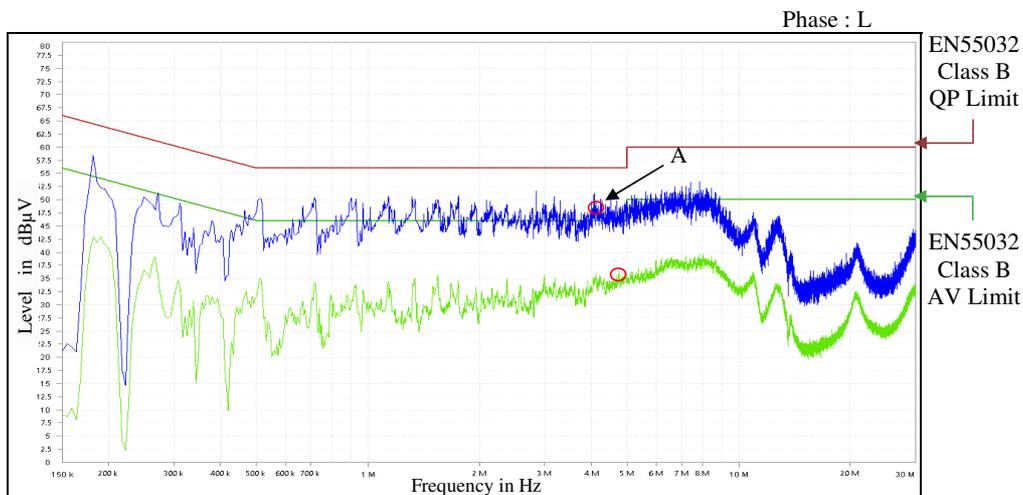
雑音端子電圧

Conducted Emission

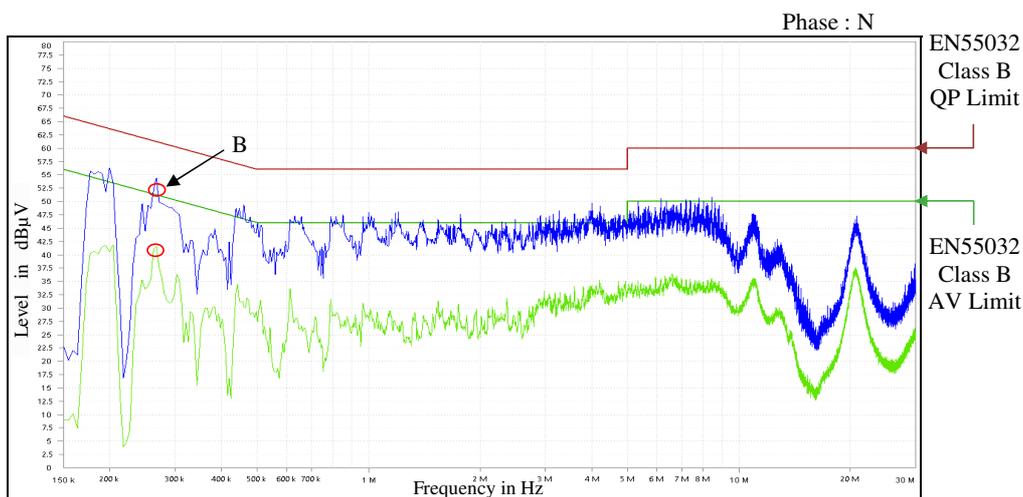
48V

Conditions Vin : 115 VAC
 Iout : 20.9 A (100%)
 Istb : 100 %
 Ta : 25 °C

Ref. Data	Point A 4.5MHz	
	Limit (dB)	Measure (dB)
QP	56.0	46.3
AV	46.0	35.2



Ref. Data	Point B (267KHz)	
	Limit (dB)	Measure (dB)
QP	61.2	52.3
AV	51.2	40.8



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.

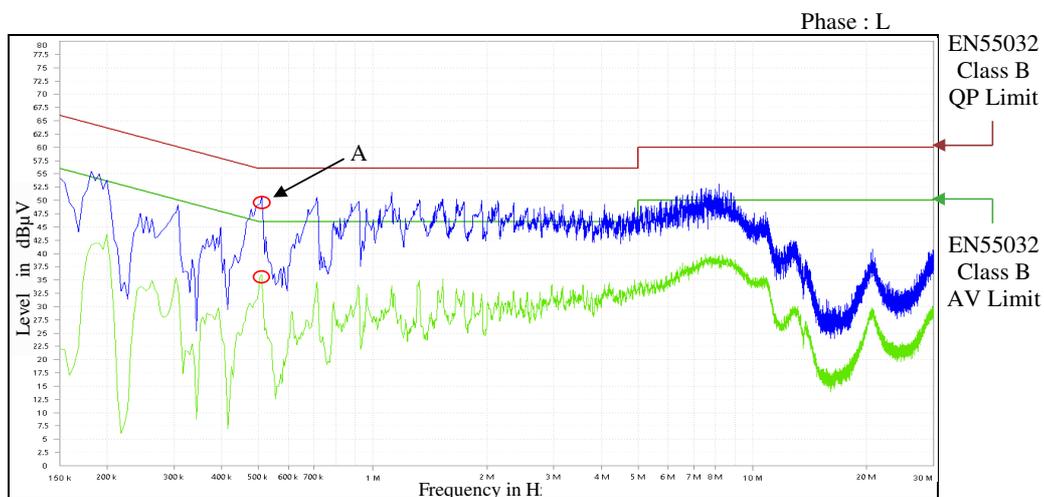
2-15. EMI特性

Electro-Magnetic Interference characteristics

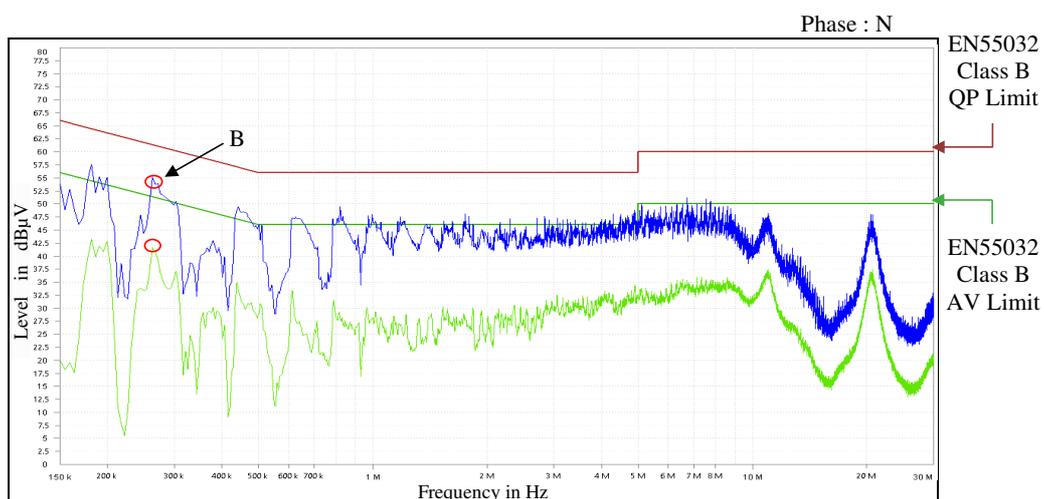
Conditions Vin : 230 VAC
 Iout : 20.9 A (100%)
 Istb : 100 %
 Ta : 25 °C

雑音端子電圧
 Conducted Emission
 48V

Point A (510KHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	56.0	49.1
AV	46.0	35.6



Point B (263kHz)		
Ref. Data	Limit (dB)	Measure (dB)
QP	61.4	52.7
AV	51.4	41.6



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

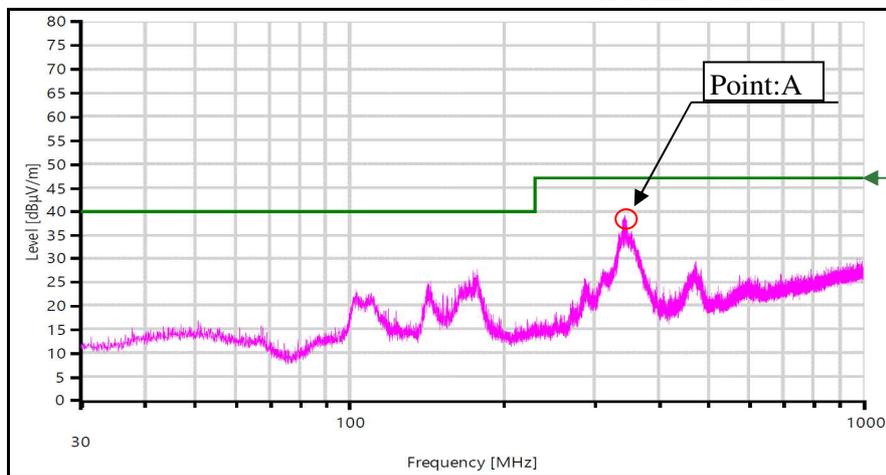
Electro-Magnetic Interference characteristics

Conditions Vin : 115 VAC
 Iout : 66.7 A (100%)
 Istb : 100 %
 Ta : 25 °C

雑音電界強度
 Radiated Emission

12V

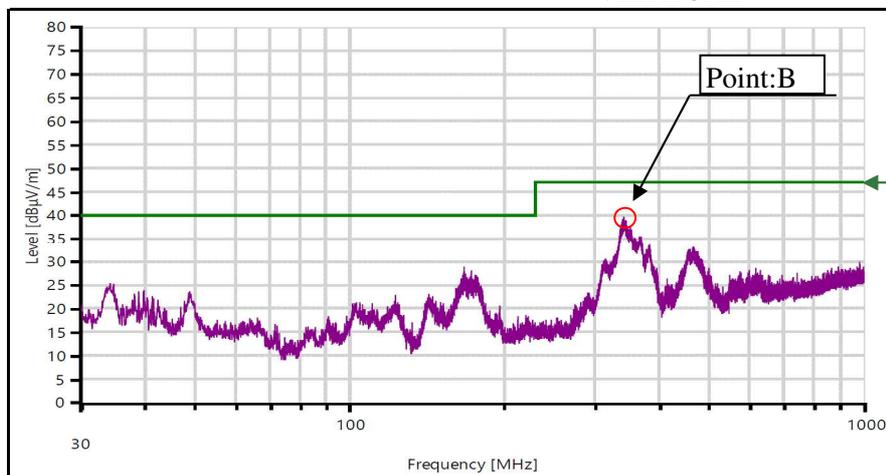
HORIZONTAL



EN55032
 Class B

Point A (344MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	39.35

VERTICAL



EN55032
 Class B

Point B (341MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	39.71

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

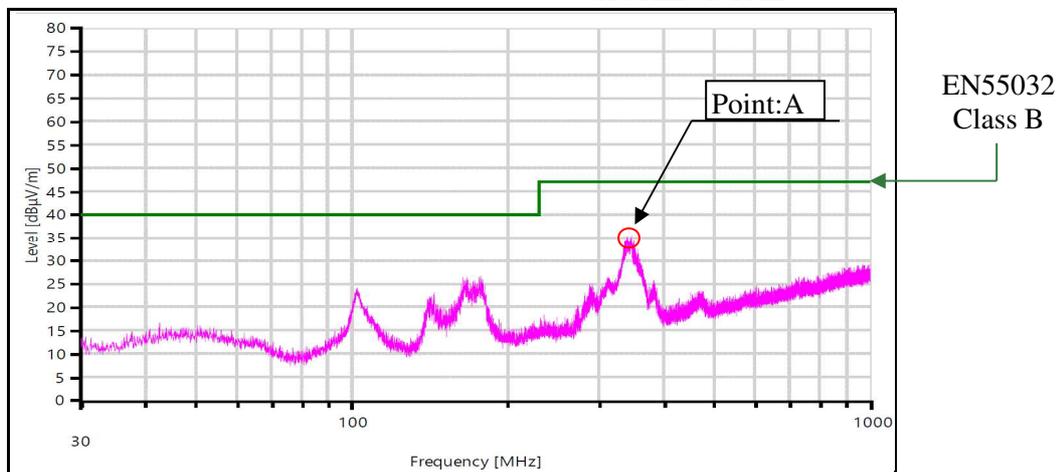
Electro-Magnetic Interference characteristics

Conditions Vin : 230 VAC
 Iout : 66.7 A (100%)
 Istb : 100 %
 Ta : 25 °C

雑音電界強度
 Radiated Emission

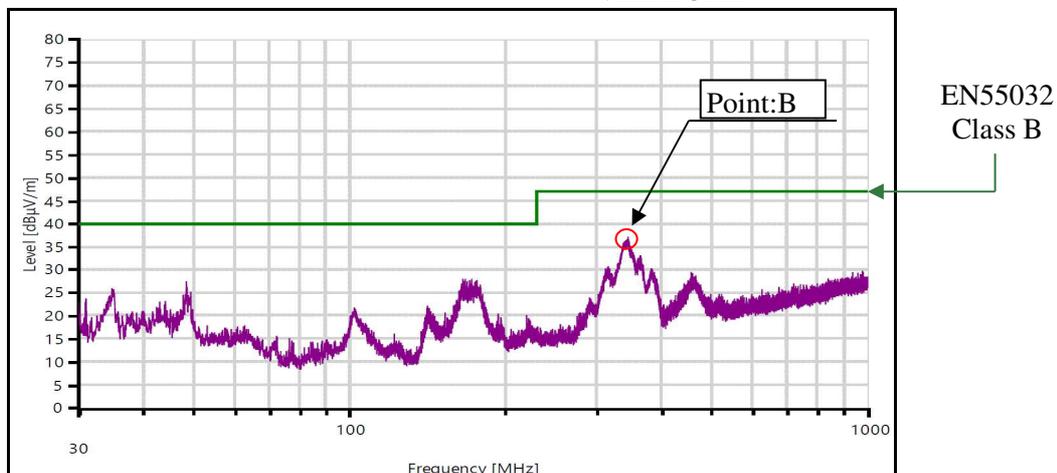
12V

HORIZONTAL



Point A (344MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	35.0

VERTICAL



Point B (354MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	37.1

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

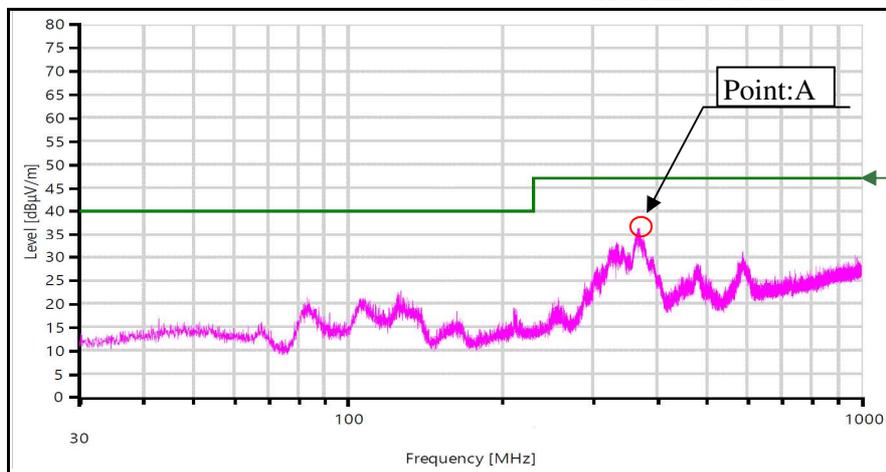
Electro-Magnetic Interference characteristics

Conditions Vin : 115 VAC
 Iout : 41.7 A (100%)
 Istb : 100 %
 Ta : 25 °C

雑音電界強度
 Radiated Emission

24V

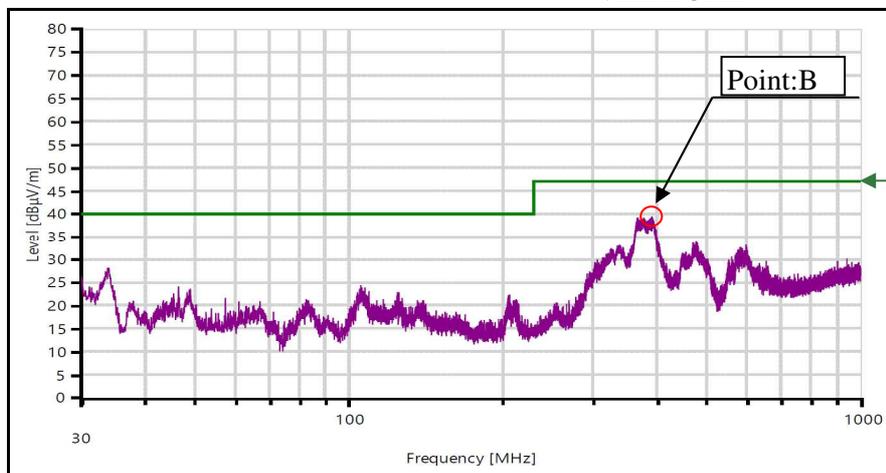
HORIZONTAL



EN55032
 Class B

Point A (369MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	36.5

VERTICAL



EN55032
 Class B

Point B (391MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	39.6

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

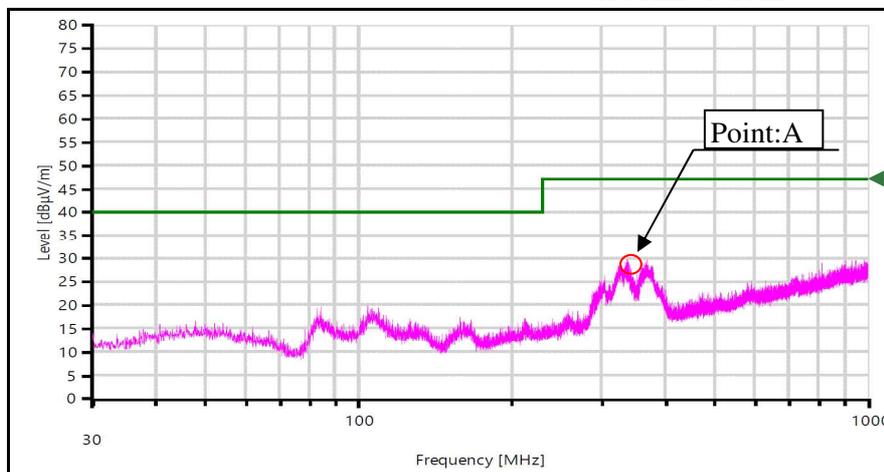
Electro-Magnetic Interference characteristics

Conditions Vin : 230 VAC
 Iout : 41.7 A (100%)
 Istb : 100 %
 Ta : 25 °C

雑音電界強度
 Radiated Emission

24V

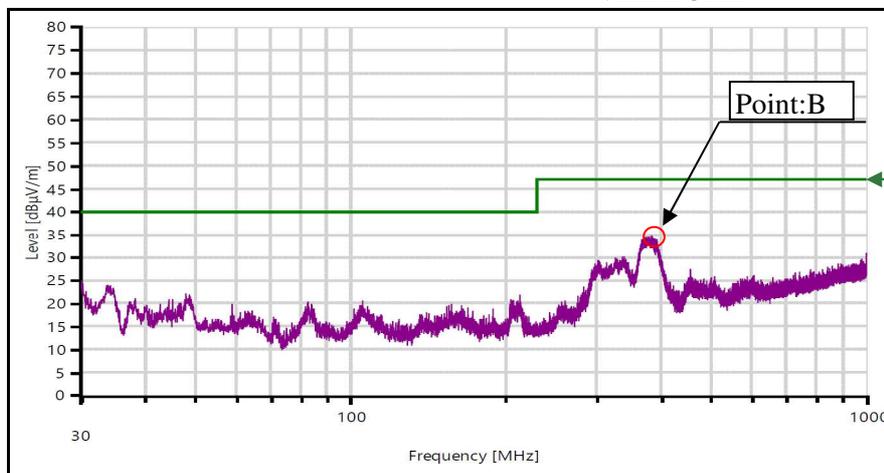
HORIZONTAL



EN55032
 Class B
 QP Limit

Point A (344MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	29.8

VERTICAL



EN55032
 Class B
 QP Limit

Point B (384MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	35.1

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 : 27.8 A (100%)

雑音電界強度

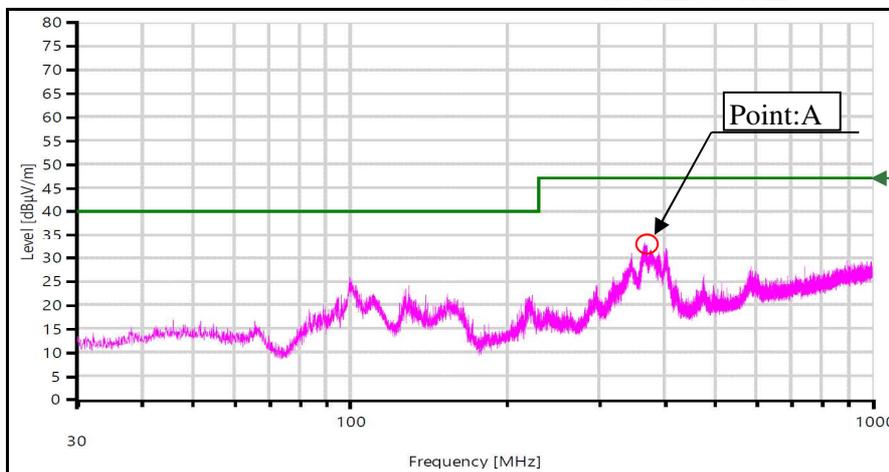
Istb : 100 %

Radiated Emission

Ta : 25 °C

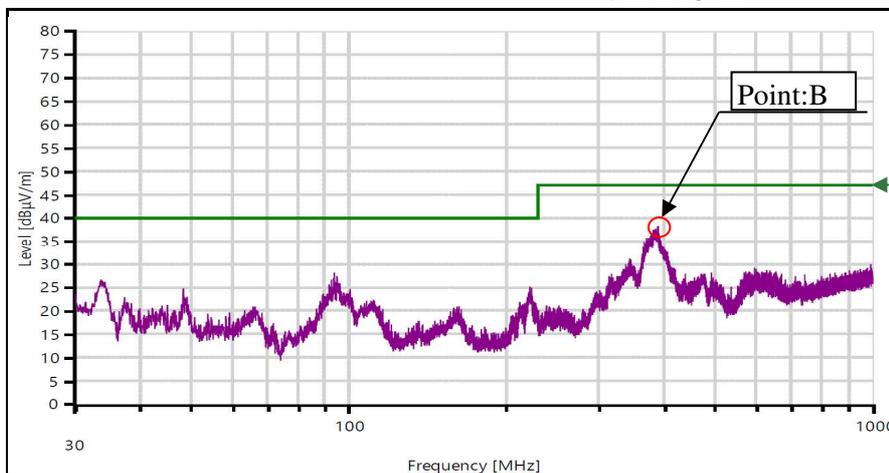
36V

HORIZONTAL



Point A (367MHz)		
Ref. Data	Limit (dBµV)	Measure (dBµV)
QP	47.0	33.1

VERTICAL



Point B (390MHz)		
Ref. Data	Limit (dBµV)	Measure (dBµV)
QP	47.0	38.3

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.

表示はピーク値
Indication is peak values.

2-15. EMI特性

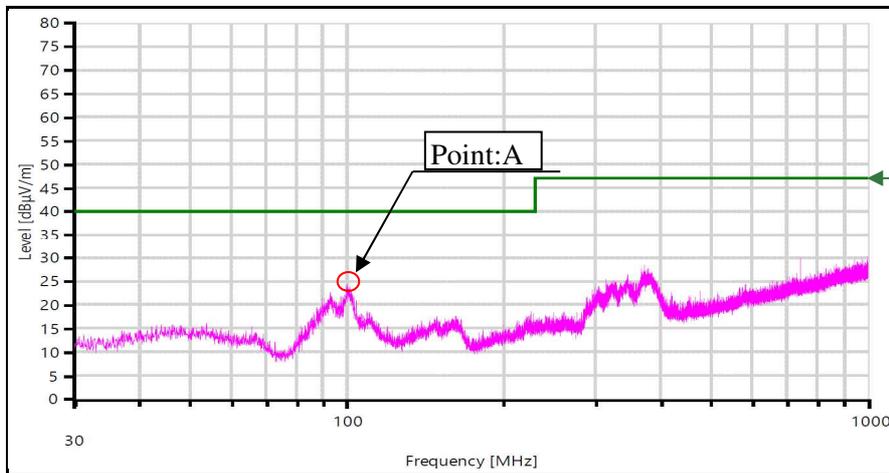
Electro-Magnetic Interference characteristics

Conditions Vin : 230 VAC
 Iout : 27.8 A (100%)
 Istb : 100 %
 Ta : 25 °C

雑音電界強度
 Radiated Emission

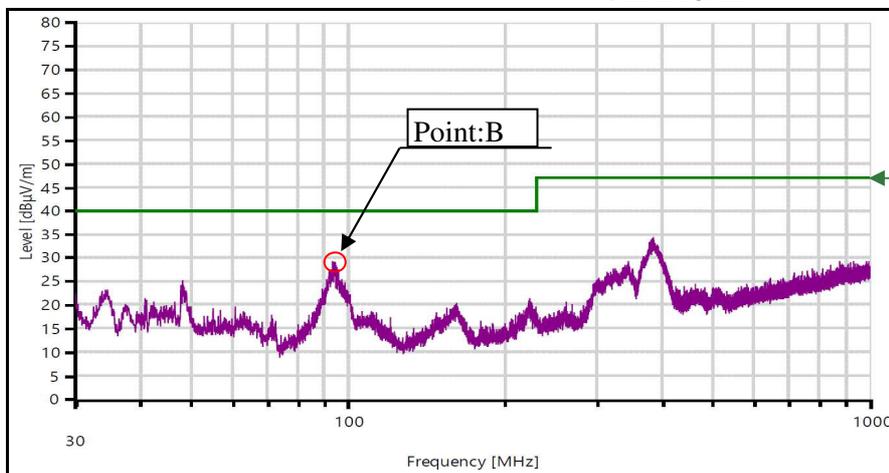
36V

HORIZONTAL



Point A (100MHz)		
Ref. Data	Limit (dBµV)	Measure (dBµV)
QP	40.0	24.4

VERTICAL



Point B (93MHz)		
Ref. Data	Limit (dBµV)	Measure (dBµV)
QP	40.0	29.3

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.

表示はピーク値
 Indication is peak values.

2-15. EMI特性

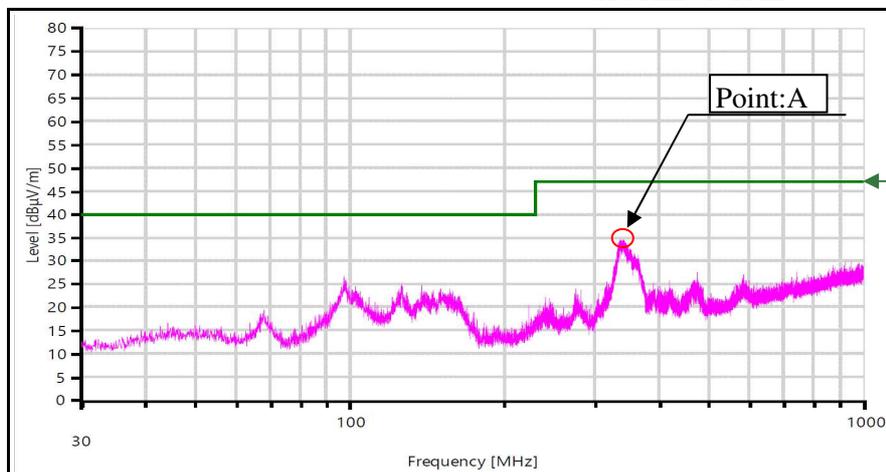
Electro-Magnetic Interference characteristics

Conditions Vin : 115 VAC
 Iout : 20.9 A (100%)
 Istb : 100 %
 Ta : 25 °C

雑音電界強度
 Radiated Emission

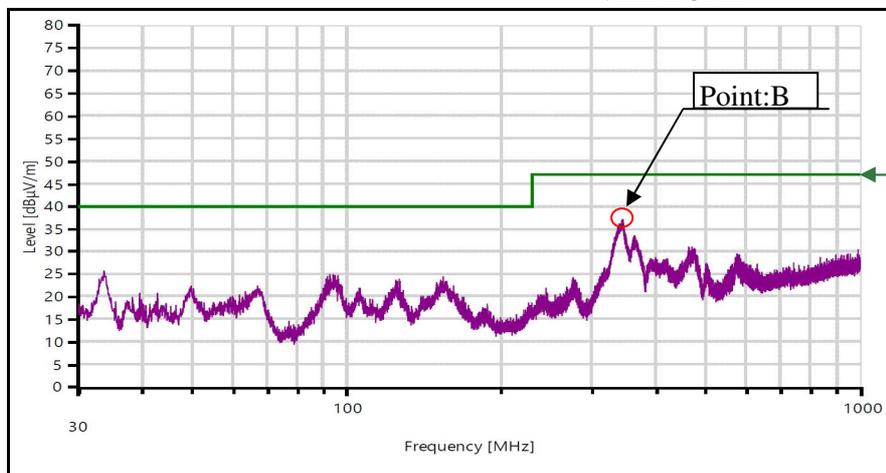
48V

HORIZONTAL



Point A (337MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	35.4

VERTICAL



Point B (346MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	37.3

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.

表示はピーク値
 Indication is peak values.

2-15. EMI特性

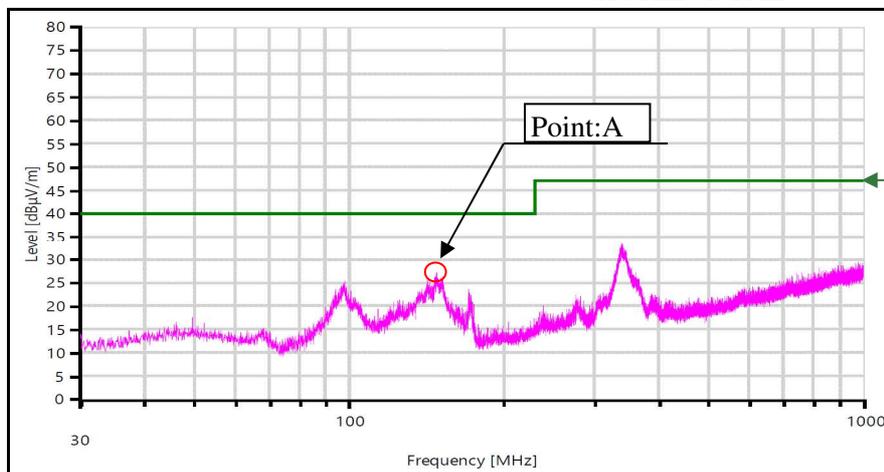
Electro-Magnetic Interference characteristics

Conditions Vin : 230 VAC
 Iout : 20.9 A (100%)
 Istb : 100 %
 Ta : 25 °C

雑音電界強度
 Radiated Emission

48V

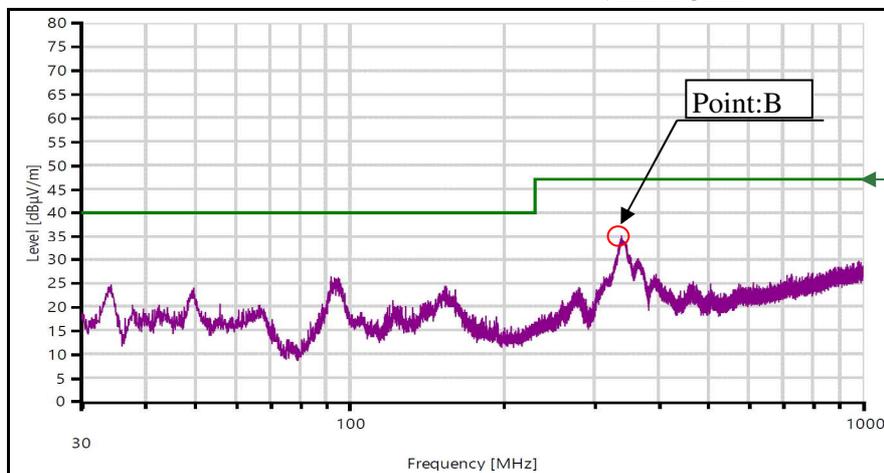
HORIZONTAL



EN55032
 Class B

Point A (148MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	40.0	27.2

VERTICAL



EN55032
 Class B

Point B (339MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	47.0	35.1

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% (41.7A)

Istb: 100% (2A)

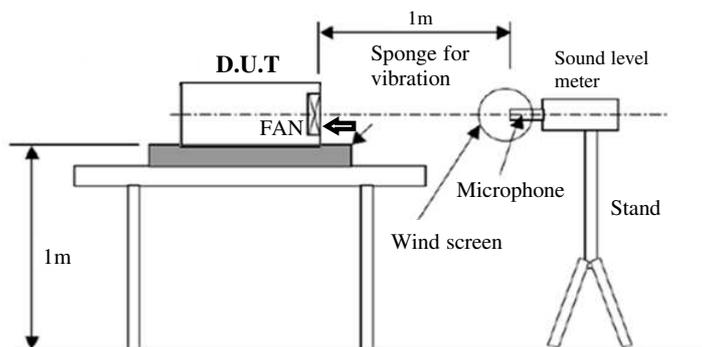
Ta: 25°C

試験装置

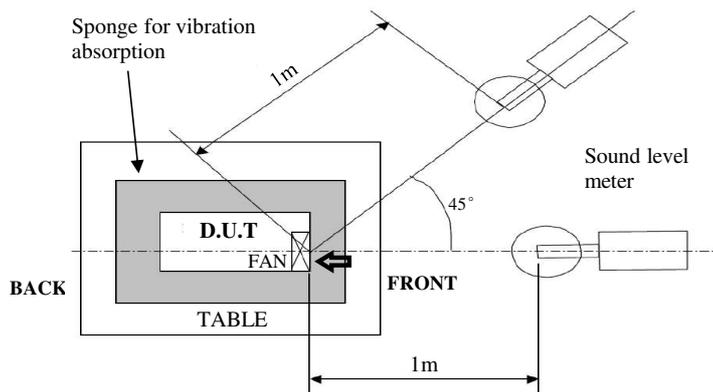
Test equipment :

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:

