

CUT35

EVALUATION DATA

型式データ

CA837-53-01A

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使用記号 Terminology used

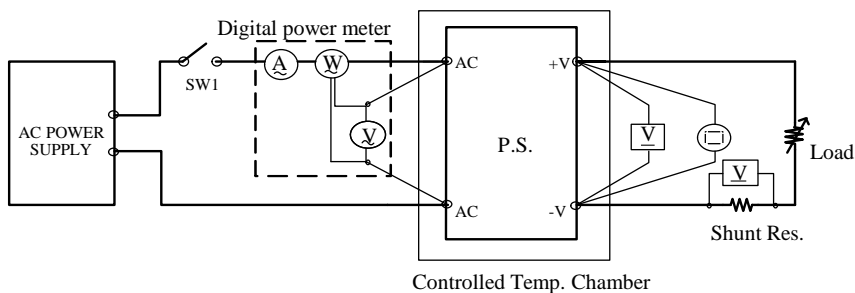
	定義	Definition
Vin 入力電圧	Input voltage
Vout 出力電圧	Output voltage
Iin 入力電流	Input current
Iout 出力電流	Output current
Ta 周囲温度	Ambient temperature
f 周波数	Frequency

1. 測定方法 Evaluation Method

1.1 測定回路 Circuit used for determination

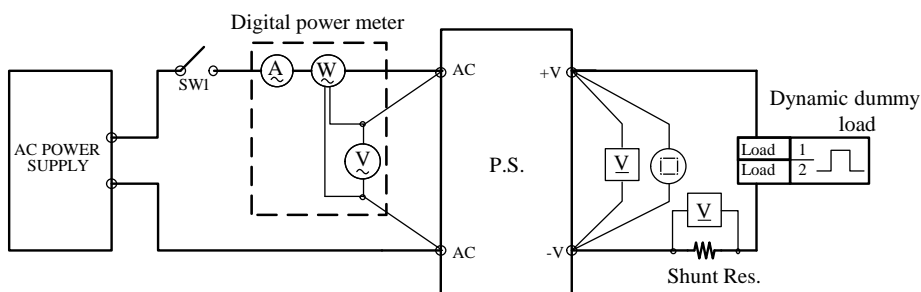
測定回路1 Circuit 1 used for determination

- ・ 静特性 Steady state data
- ・ 過電流保護特性 Over current protection (OCP) characteristics
- ・ 過電圧保護特性 Over voltage protection (OVP) characteristics
- ・ 出力立ち上がり特性 Output rise characteristics
- ・ 出力立ち下がり特性 Output fall characteristics
- ・ 出力保持時間特性 Hold up time characteristics

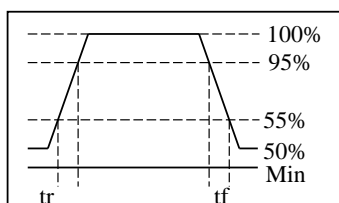


測定回路2 Circuit 2 used for determination

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

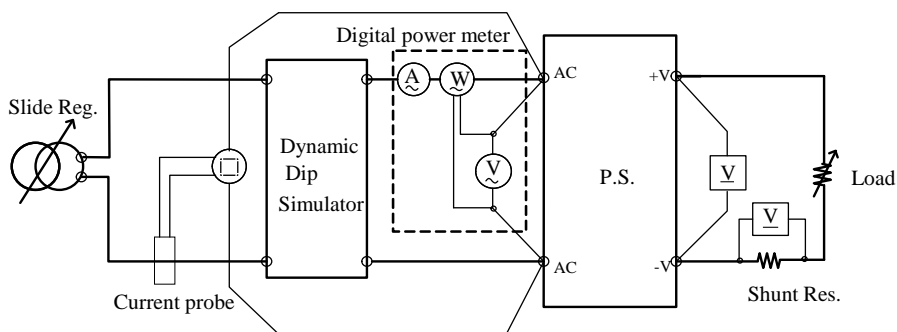


Output current waveform



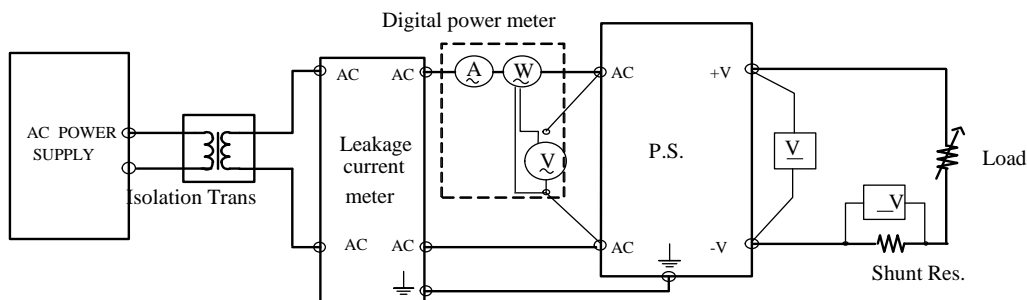
測定回路3 Circuit 3 used for determination

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



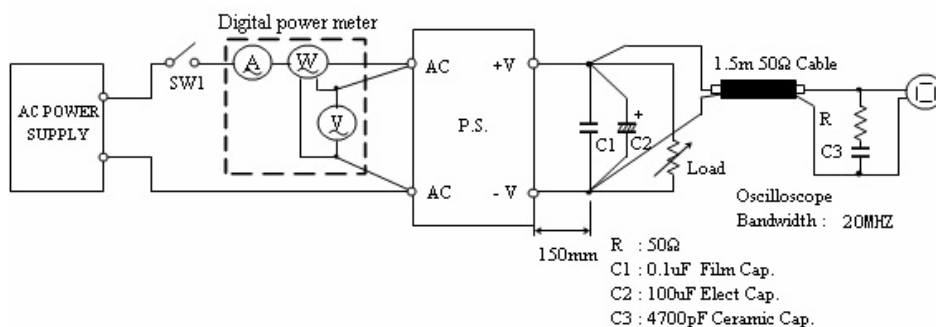
測定回路4 Circuit 4 used for determination

- ・リーク電流特性 Leakage current characteristics



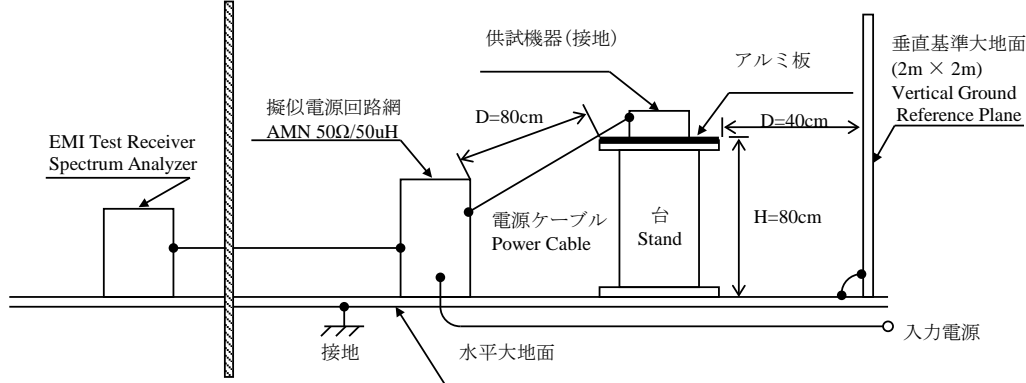
測定回路5 Circuit 5 used for determination

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

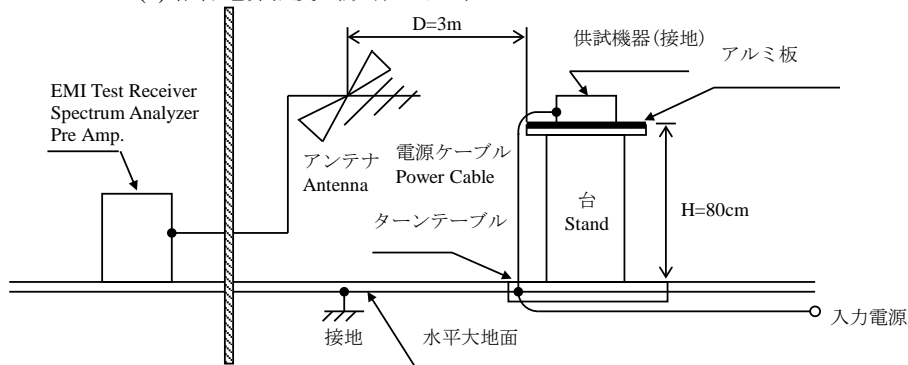


測定構成 Configuration used for determination

- ・ EMI 特性 Electro-Magnetic Interference characteristics
- (a) 雑音端子電圧 (帰還ノイズ) Conducted Emission



- (b) 雑音電界強度 (放射ノイズ) Radiated Emission



1.2 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	TEKTRONIX	TDS7054
2	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DLM2054
3	DIGITAL MULTIMETER	FLUKE	45
4	DIGITAL POWER METER	YOKOGAWA ELECT.	WT210
5	CURRENT PROBE	TEKTRONIX	TCP312
6	CURRENT PROBE	YOKOGAWA ELECT.	701933
7	VOLTAGE PROBE	TEKTRONIX	P5100
8	DYNAMIC DUMMY LOAD	CHROMA	63030
9	CVCF	KIKUSUI	PCR2000L
10	LEAKAGE CURRENT METER	SIMPSON	228
11	CONTROLLED TEMP. CHAMBER	TABAI-ESPEC	SU-662
12	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCI-03
13	AMN	SCHWARZBECK	NNLK8121
14	ANTENNA	SCHWARZBECK	VULB9168

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

Model:CUT35-522

CH1: 5V 1. Regulation - line and load Condition Ta: 25 °C

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	5.040V	5.039V	5.036V	5.036V	4mV	0.080%
50%	5.038V	5.038V	5.038V	5.038V	0mV	0.000%
100%	5.039V	5.039V	5.039V	5.040V	1mV	0.020%
load regulation	2mV	1mV	3mV	4mV		
	0.040%	0.020%	0.060%	0.080%		

2. Temperature drift

Conditions Vin : 100 VAC
Iout : 100 %

Ta	-20°C	+25°C	+55°C	temperature stability	
Vout	5.004V	5.039V	5.039V	35mV	0.700%

CH2: 12V 1. Regulation - line and load Condition Ta: 25 °C

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	11.949V	11.952V	11.955V	11.955V	6mV	0.050%
50%	11.869V	11.868V	11.867V	11.867V	2mV	0.017%
100%	11.850V	11.849V	11.848V	11.847V	3mV	0.025%
load regulation	99mV	103mV	107mV	108mV		
	0.825%	0.858%	0.892%	0.900%		

2. Temperature drift

Conditions Vin : 100 VAC
Iout : 100 %

Ta	-20°C	+25°C	+55°C	temperature stability	
Vout	11.857V	11.849V	11.846V	11mV	0.092%

CH3: -12V 1. Regulation - line and load Condition Ta: 25 °C

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	-11.961V	-11.964V	-11.969V	-11.970V	9mV	0.075%
50%	-12.044V	-12.044V	-12.043V	-12.043V	1mV	0.008%
100%	-12.043V	-12.042V	-12.040V	-12.039V	4mV	0.033%
load regulation	83mV	80mV	74mV	73mV		
	-0.692%	-0.667%	-0.617%	-0.608%		

2. Temperature drift

Conditions Vin : 100 VAC
Iout : 100 %

Ta	-20°C	+25°C	+55°C	temperature stability	
Vout	-12.055V	-12.042V	-12.044V	13mV	0.108%

3. Start up voltage and Drop out voltage

Conditions Ta : 25 °C
Iout : 100 %

Start up voltage (Vin)	53VAC
Drop out voltage (Vin)	50VAC

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

Model:CUT35-5FF

CH1: 5V 1. Regulation - line and load Condition Ta: 25 °C

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	5.097V	5.097V	5.097V	5.097V	0mV	0.000%
50%	5.095V	5.095V	5.096V	5.096V	1mV	0.020%
100%	5.097V	5.097V	5.097V	5.097V	0mV	0.000%
load regulation	2mV	2mV	1mV	1mV		
	0.040%	0.040%	0.020%	0.020%		

2. Temperature drift

Conditions Vin: 100 VAC
Iout: 100 %

Ta	-20°C	+25°C	+55°C	temperature stability	
Vout	5.073V	5.097V	5.097V	24mV	0.480%

CH2: 15V 1. Regulation - line and load Condition Ta: 25 °C

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	15.049V	15.050V	15.044V	15.042V	8mV	0.053%
50%	14.929V	14.928V	14.924V	14.923V	6mV	0.040%
100%	14.923V	14.922V	14.919V	14.914V	9mV	0.060%
load regulation	126mV	128mV	125mV	128mV		
	0.840%	0.853%	0.833%	0.853%		

2. Temperature drift

Conditions Vin: 100 VAC
Iout: 100 %

Ta	-20°C	+25°C	+55°C	temperature stability	
Vout	14.918V	14.922V	14.913V	9mV	0.060%

CH3: -15V 1. Regulation - line and load Condition Ta: 25 °C

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	-15.094V	-15.097V	-15.105V	-15.108V	14mV	0.093%
50%	-15.220V	-15.220V	-15.224V	-15.224V	4mV	0.027%
100%	-15.212V	-15.212V	-15.214V	-15.213V	2mV	0.013%
load regulation	126mV	123mV	119mV	116mV		
	-0.840%	-0.820%	-0.793%	-0.773%		

2. Temperature drift

Conditions Vin: 100 VAC
Iout: 100 %

Ta	-20°C	+25°C	+55°C	temperature stability	
Vout	-15.203V	-15.212V	-15.210V	9mV	0.060%

3. Start up voltage and Drop out voltage

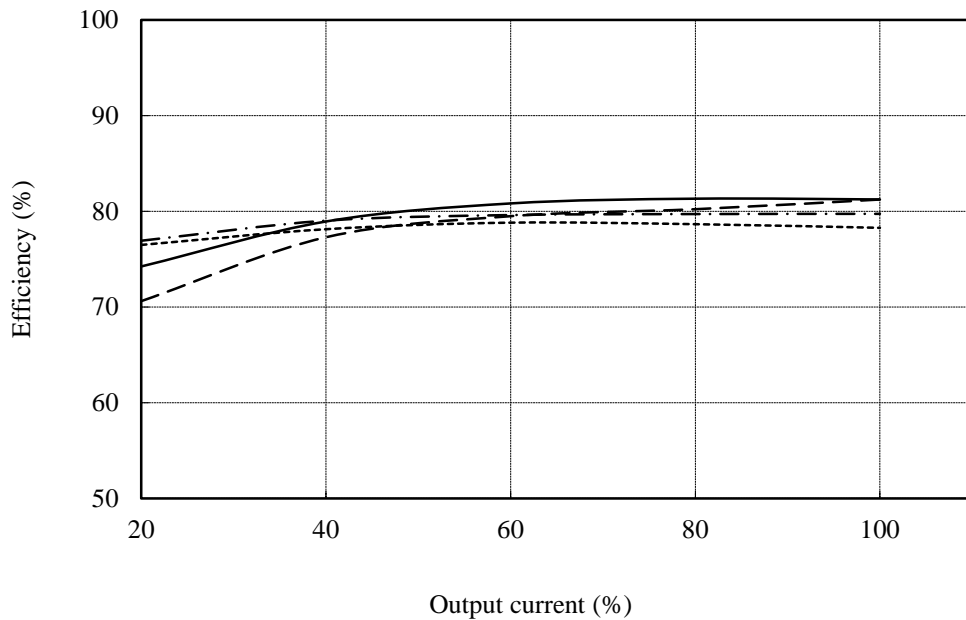
Conditions Ta: 25 °C
Iout: 100 %

Start up voltage (Vin)	53VAC
Drop out voltage (Vin)	49VAC

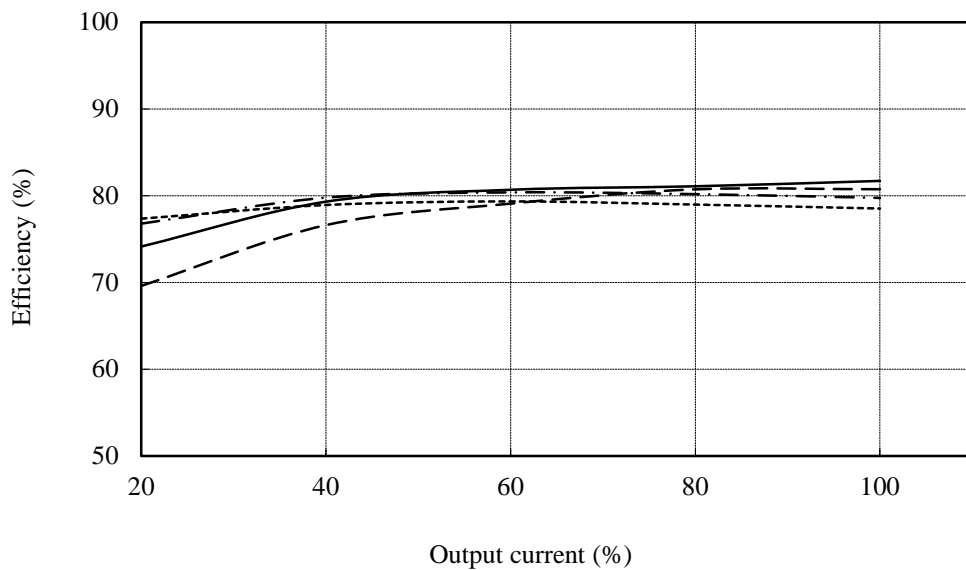
(2) 効率が出力電流

Efficiency vs. Output current
Model: CUT35-522

Conditions Vin : 85 VAC -----
: 100 VAC -.-.-.-
: 200 VAC ————
: 265 VAC - - - -
Ta : 25 °C



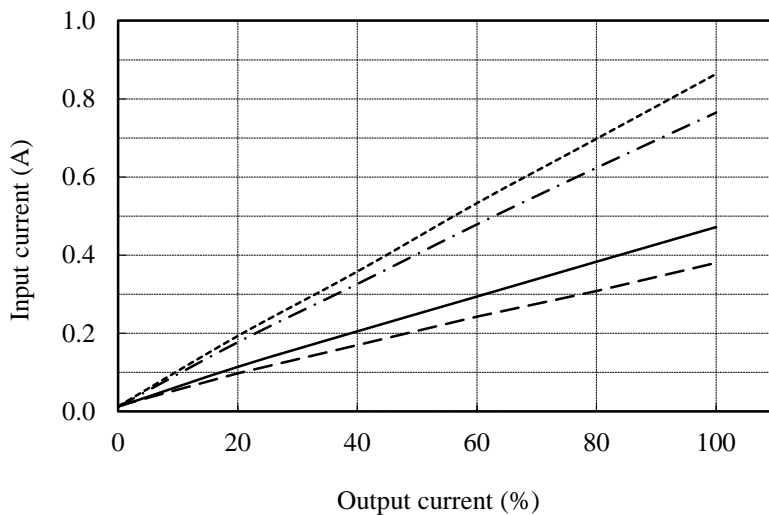
Model: CUT35-5FF



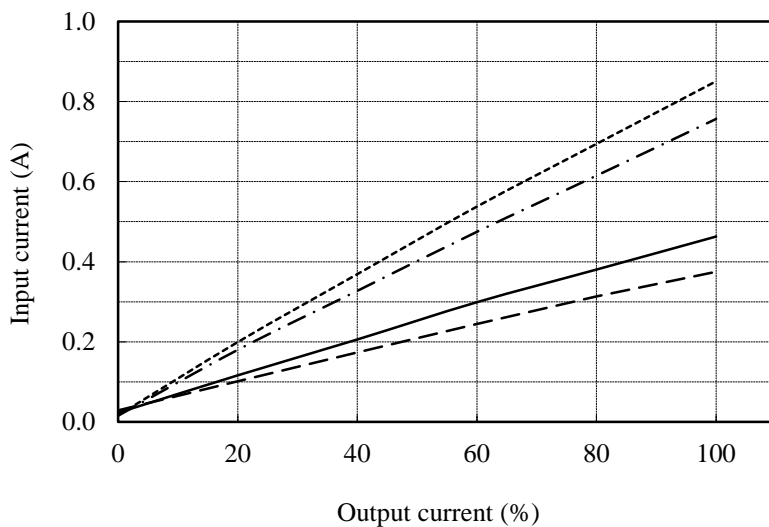
(3) 入力電流対出力電流

Input current vs. Output current
 Model:CUT35-522

Conditions Vin : 85 VAC -----
 : 100 VAC -.-.-.-
 : 200 VAC ————
 : 265 VAC - - - -
 Ta : 25 °C



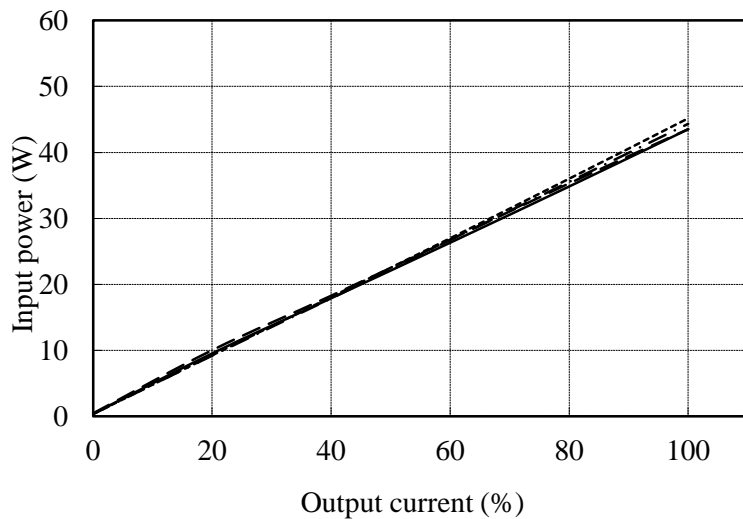
Model:CUT35-5FF



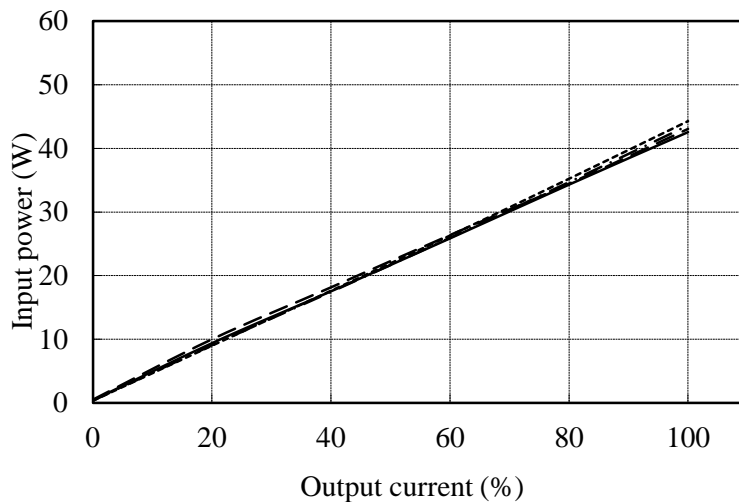
(4) 入力電力対出力電流

Input power vs. Output current
 Model: CUT35-522

Conditions Vin : 85 VAC ----
 : 100 VAC -·-·
 : 200 VAC ———
 : 265 VAC - - - -
 Ta : 25 °C



Model: CUT35-5FF



2.2 過電流保護特性

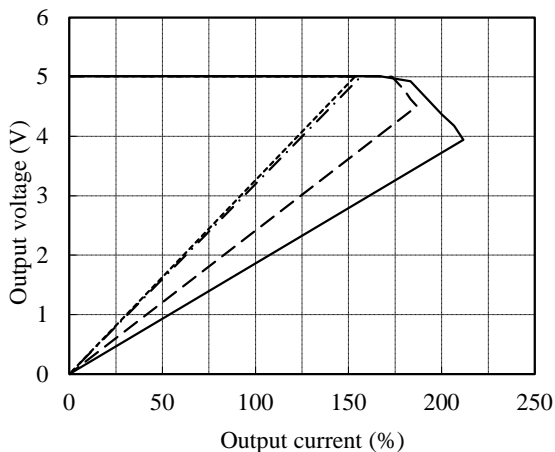
Over current protection (OCP) characteristics

Model: CUT35-522

Conditions Vin : 85 VAC -----
 100 VAC - - - - -
 200 VAC - - - - -
 265 VAC - - - - -

Ta : 25 °C

CH1: 5V

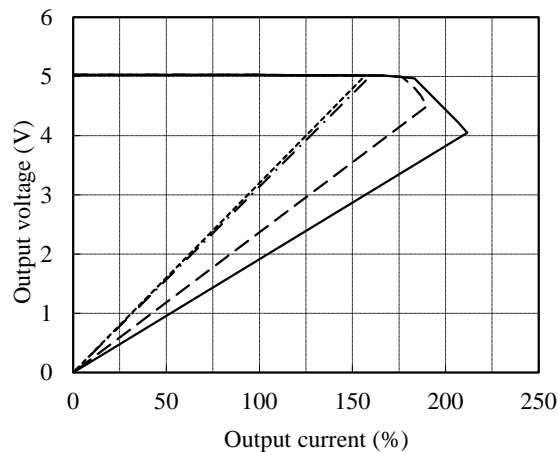


Model: CUT35-5FF

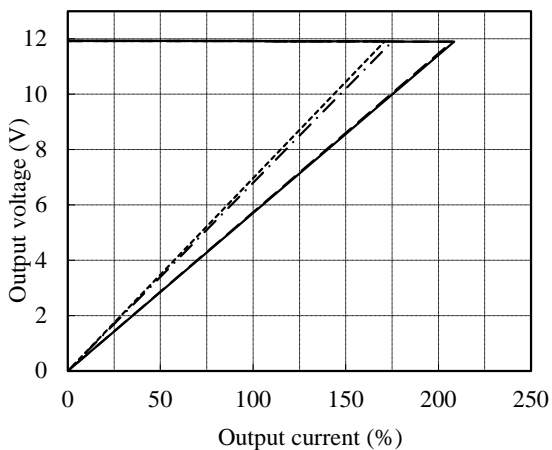
Conditions Vin : 85 VAC -----
 100 VAC - - - - -
 200 VAC - - - - -
 265 VAC - - - - -

Ta : 25 °C

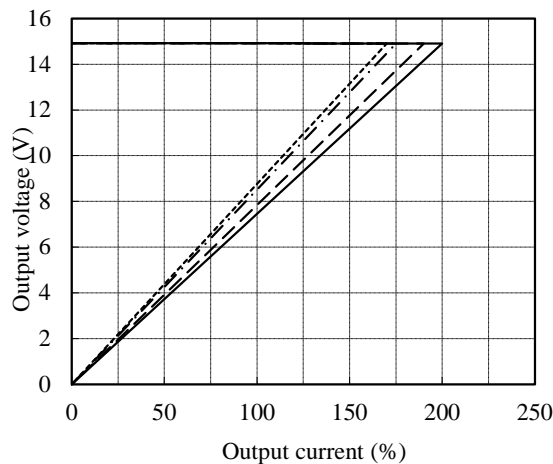
CH1: 5V



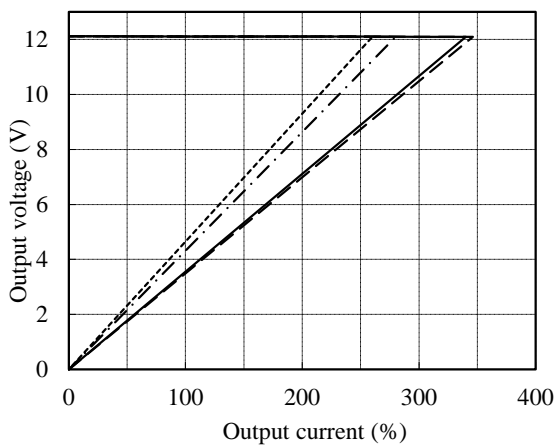
CH2: +12V



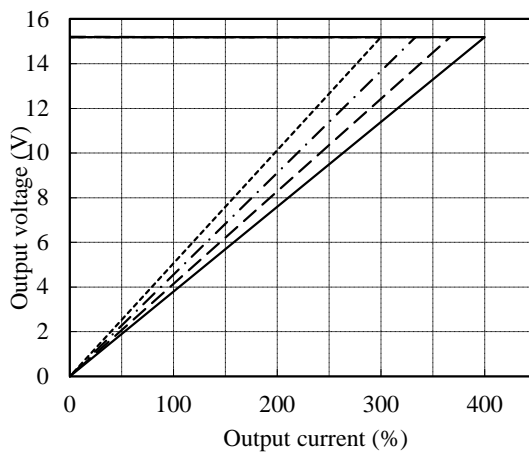
CH2: +15V



CH3: -12V



CH3: -15V

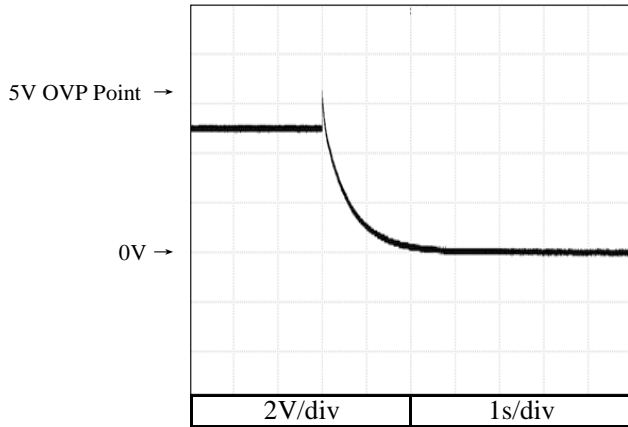


2.3 過電圧保護特性

Over voltage protection (OVP) characteristics

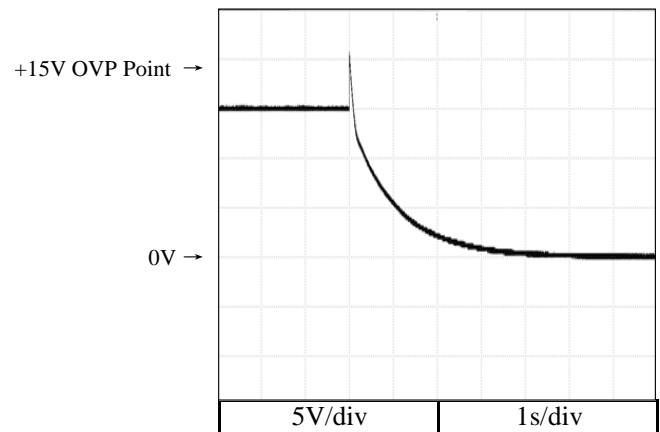
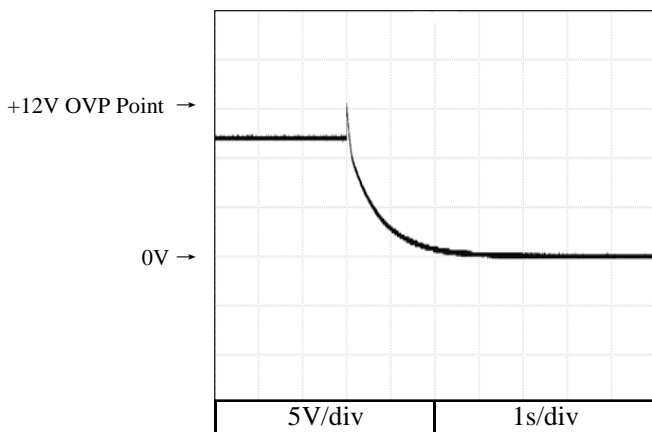
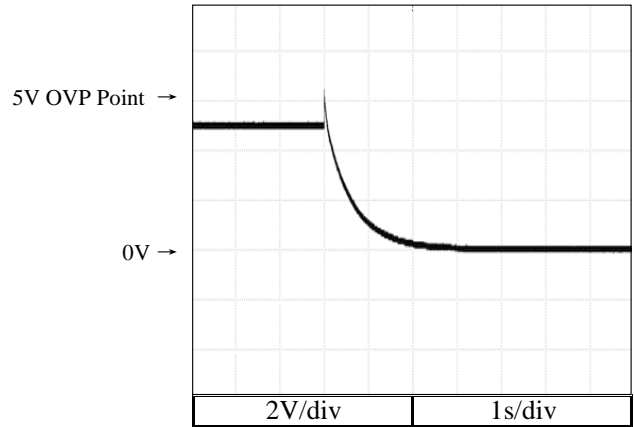
Model: CUT35-522

Conditions Vin : 100 VAC
Iout : 0 %
Ta : 25 °C



Model: CUT35-5FF

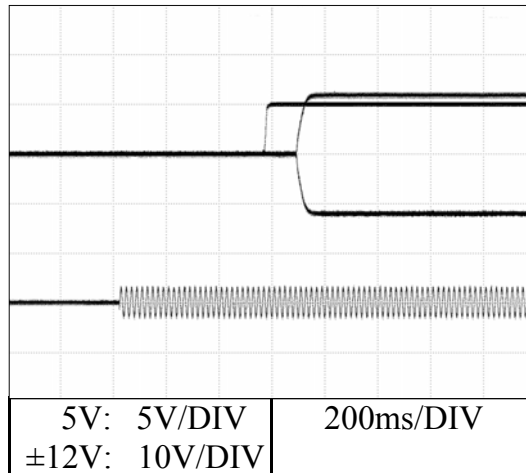
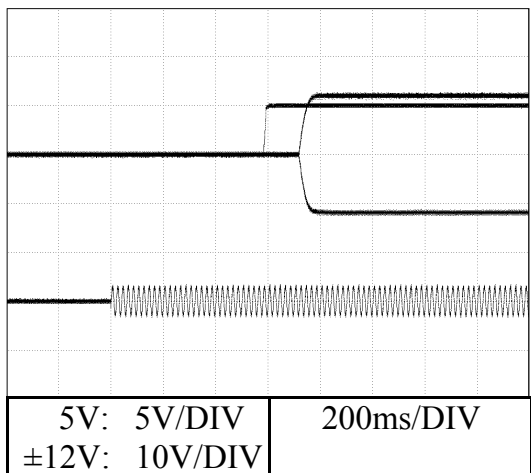
Conditions Vin : 100 VAC
Iout : 0 %
Ta : 25 °C



2.4 出力立ち上がり特性
 Output rise characteristics
 Model: CUT35-522

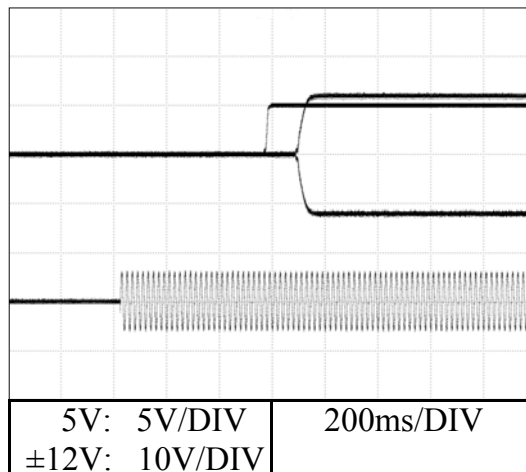
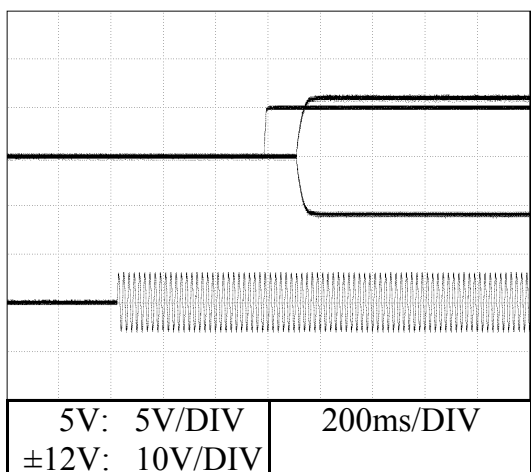
Conditions Ta : 25 °C
 Vin : 100 VAC
 Iout : 100%

Iout : 0%



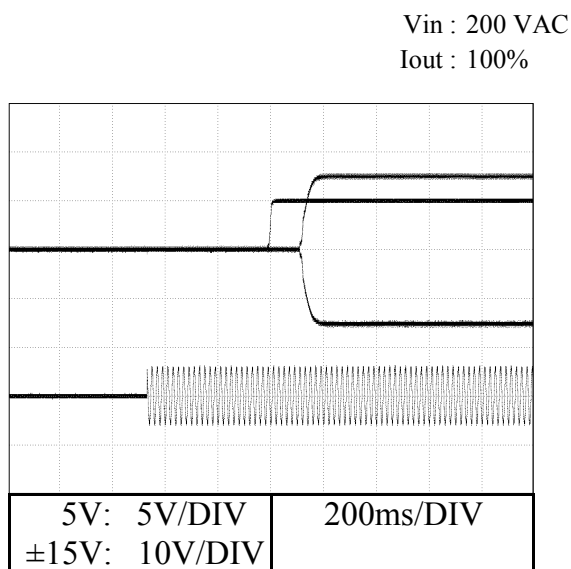
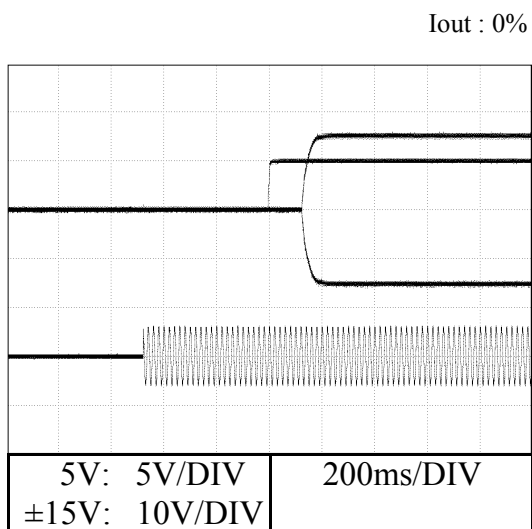
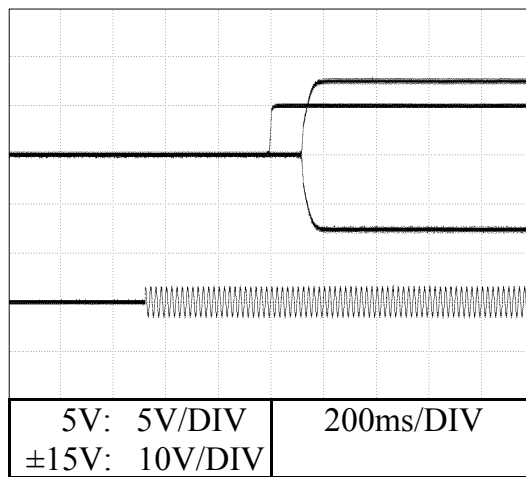
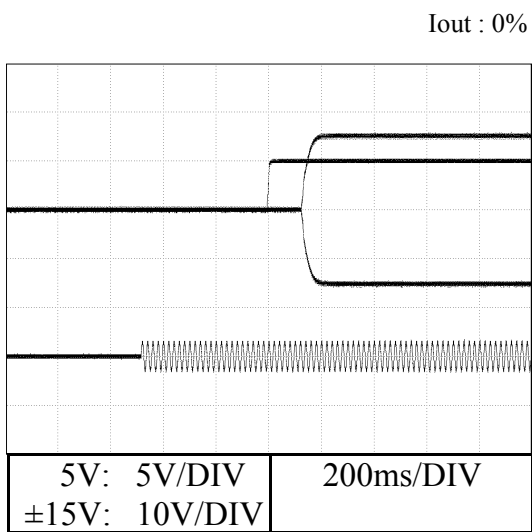
Vin : 200 VAC
 Iout : 100%

Iout : 0%



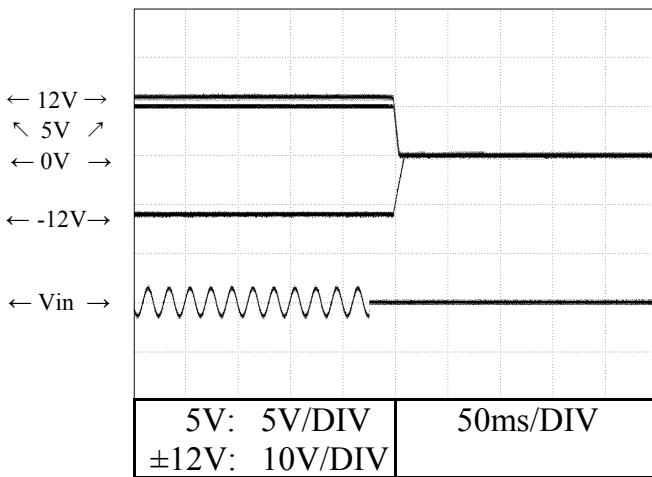
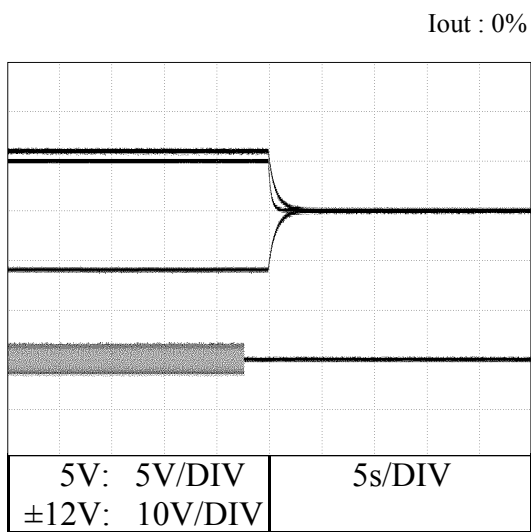
2.4 出力立ち上がり特性
 Output rise characteristics
 Model: CUT35-5FF

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

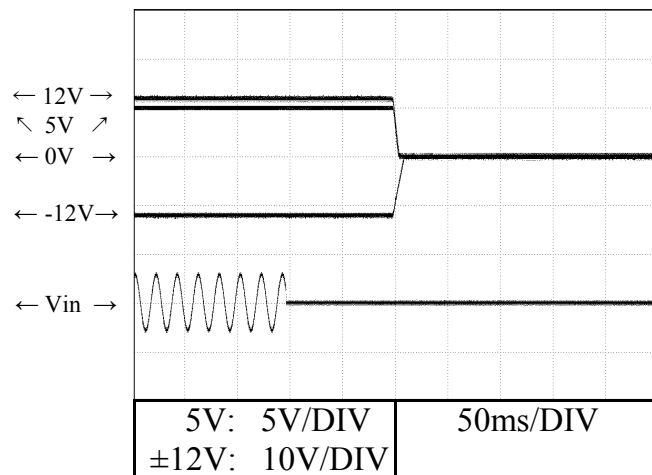
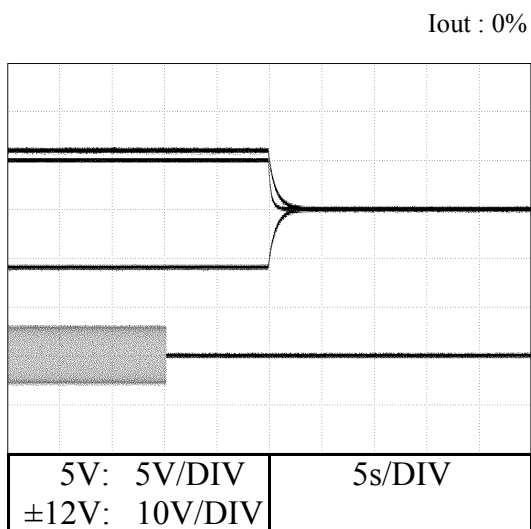


2.5 出力立ち下がり特性
 Output fall characteristics
 Model: CUT35-522

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

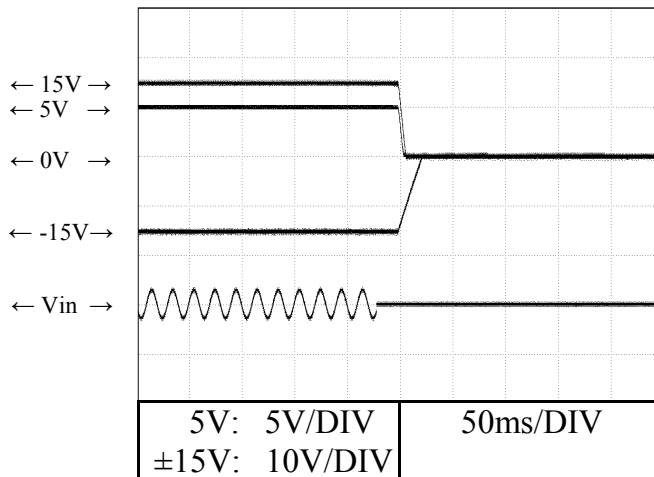
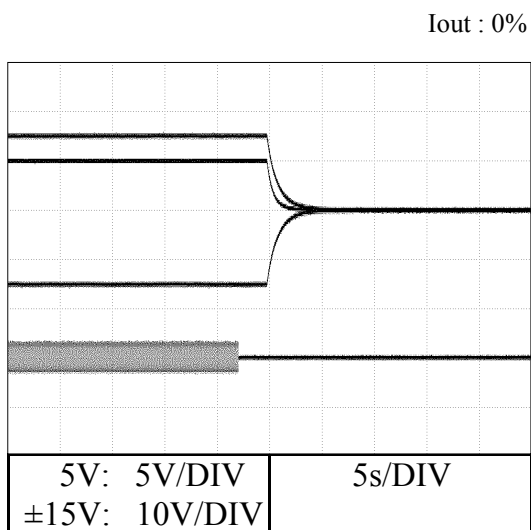


Vin : 200 VAC
 Iout : 100%

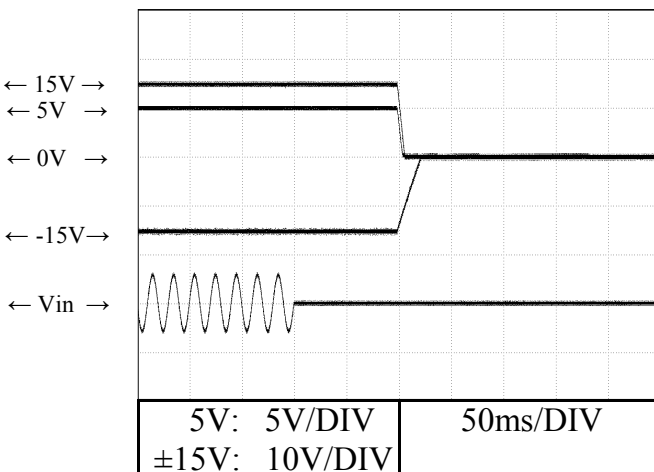
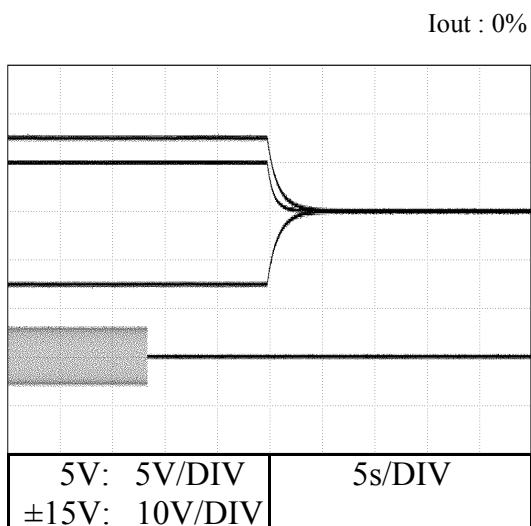


2.5 出力立ち下がり特性
 Output fall characteristics
 Model: CUT35-5FF

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



Vin : 200 VAC
 Iout : 100%

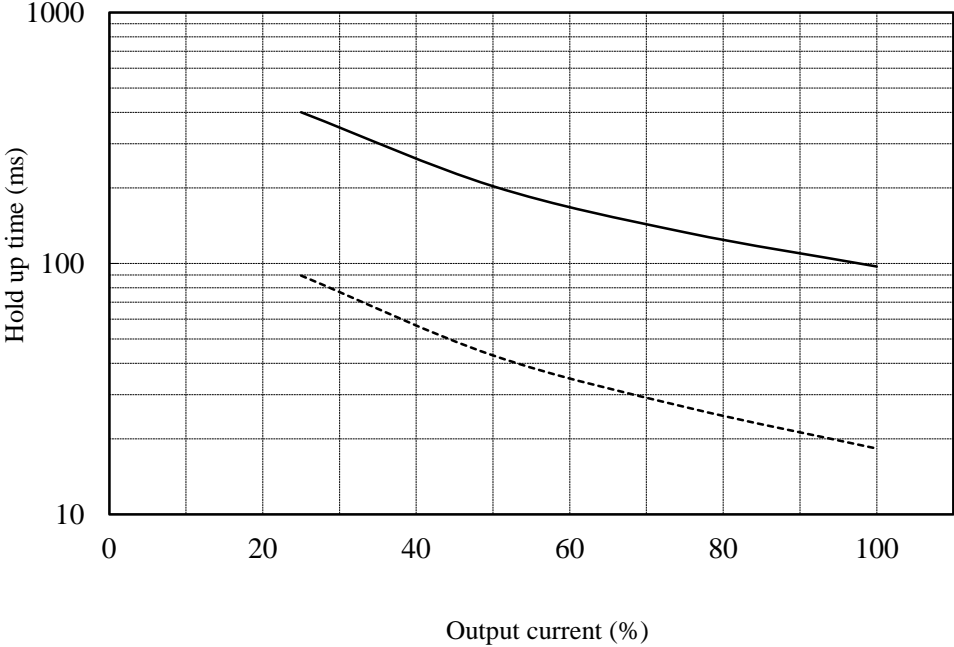


2.6 出力保持時間特性

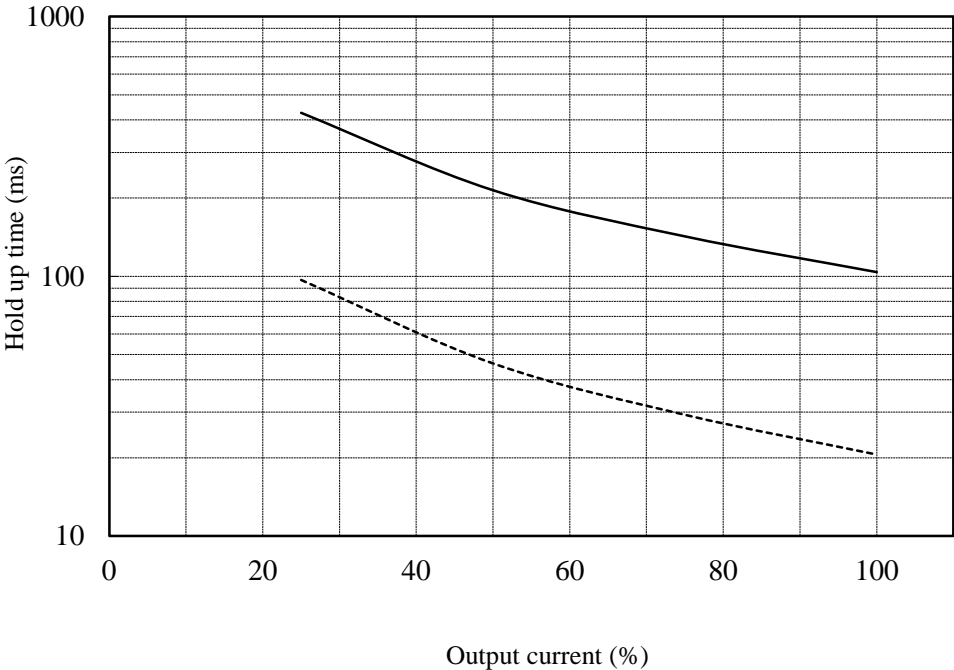
Hold up time characteristics

Conditions Vin : 100 VAC -----
 200 VAC ————
 Ta : 25 °C

Model:CUT35-522



Model:CUT35-5FF



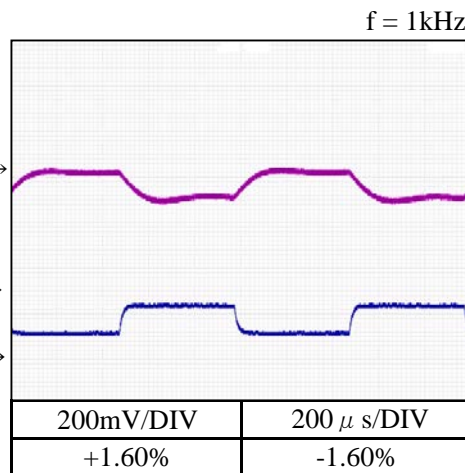
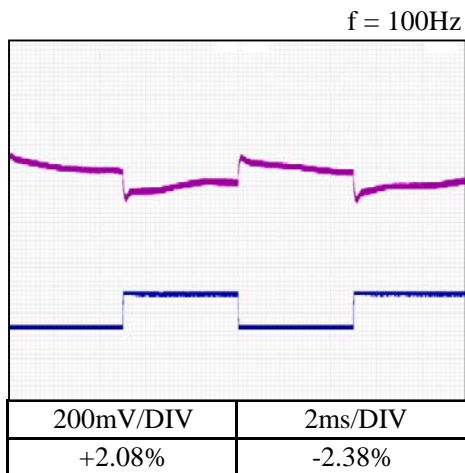
2.7 過渡応答（負荷急変）特性

Dynamic load response characteristics
Model: CUT35-522

Conditions Vin : 100VAC
Ta : 25°C
(tr = tf = 75us)

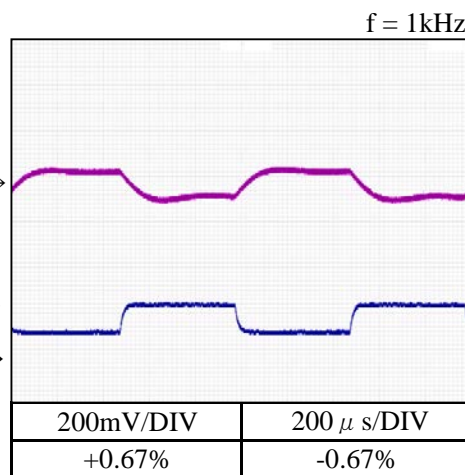
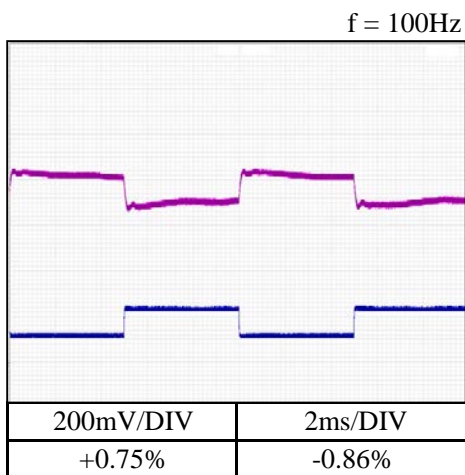
5V

Iout : 5V:50% ↔ 100%
±12V:100%



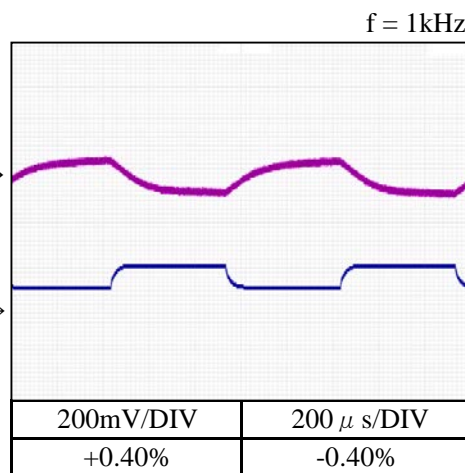
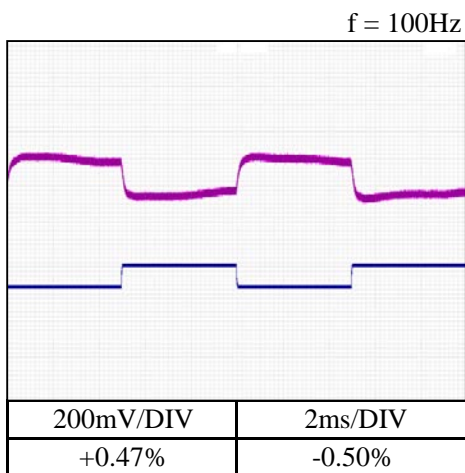
+12V

Iout : 12V:50% ↔ 100%
5V,-12V:100%



-12V

Iout : -12V:50% ↔ 100%
5V,+12V:100%



2.7 過渡応答（負荷急変）特性

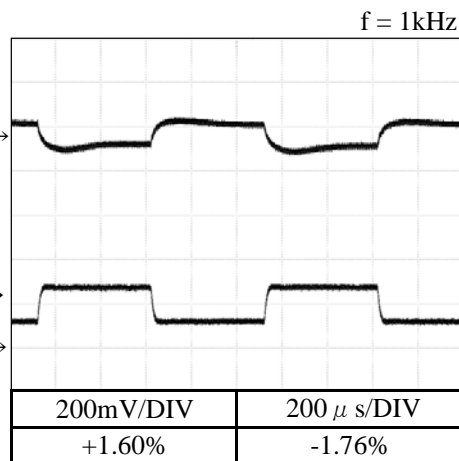
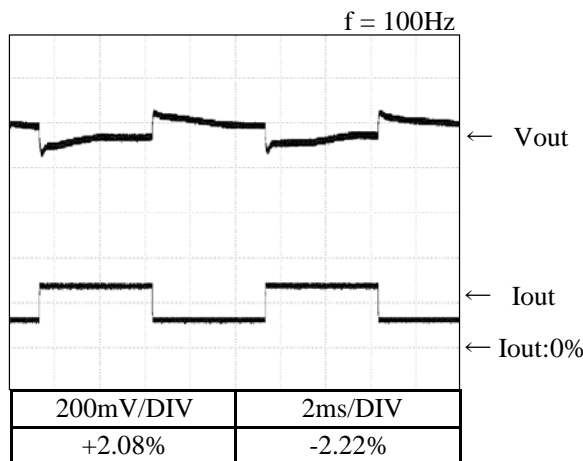
Dynamic load response characteristics

Model:CUT35-5FF

Conditions Vin : 100VAC
 Ta : 25°C
 (tr = tf = 75us)

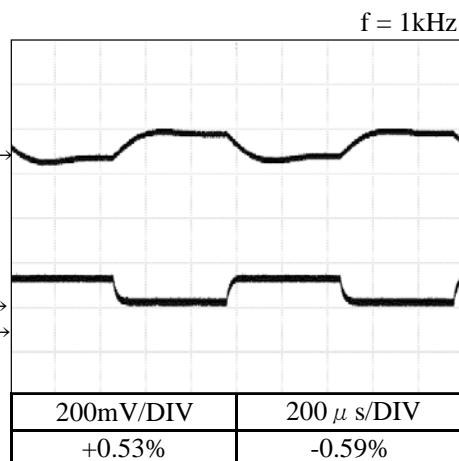
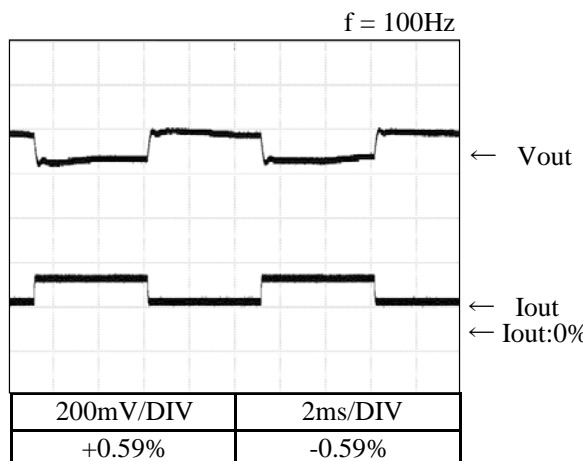
5V

Iout : 5V:50% ↔ 100%
 ±15V:100%



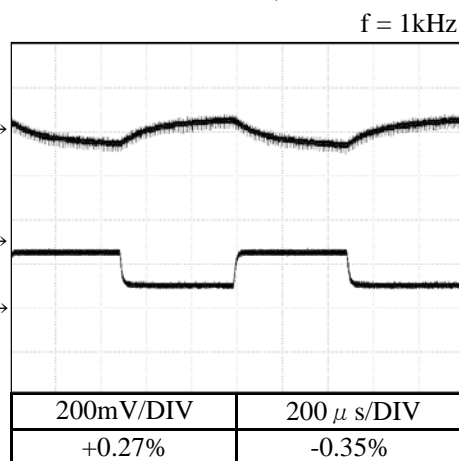
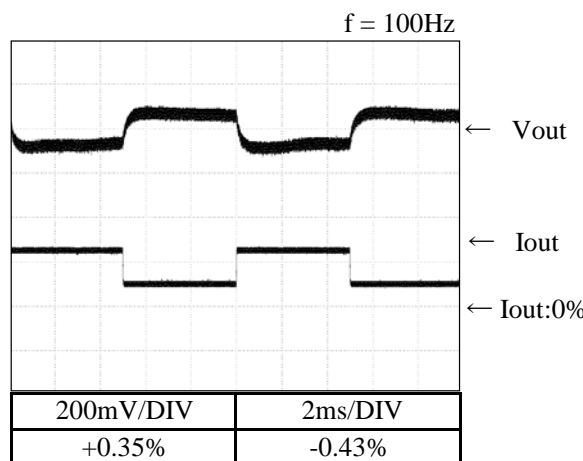
+15V

Iout : 15V:50% ↔ 100%
 5V,-15V:100%



-15V

Iout : -15V:50% ↔ 100%
 5V,+15V:100%



2.8 入力電圧瞬停特性

Response to brown out characteristics

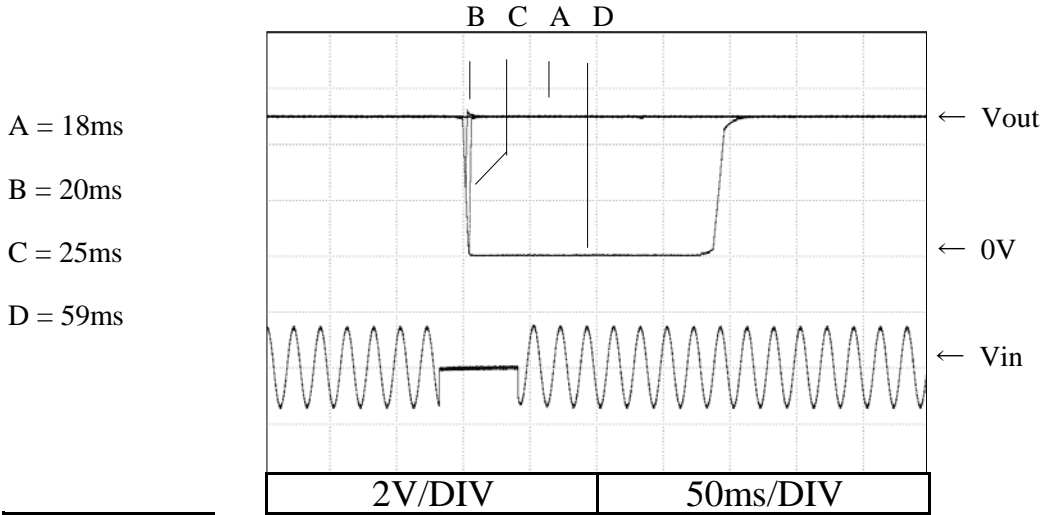
Model: CUT35-522

Conditions Vin : 100 VAC

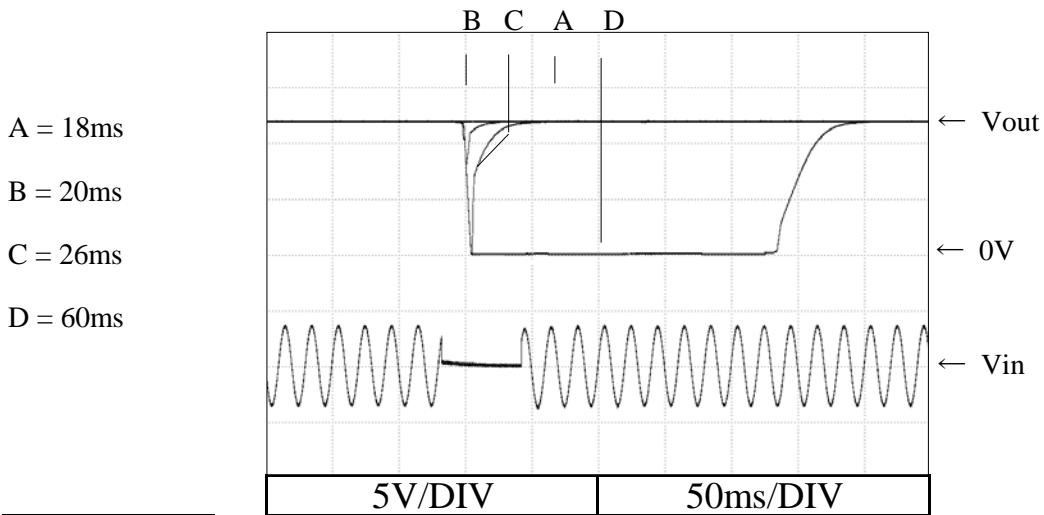
Iout : 100 %

Ta : 25 °C

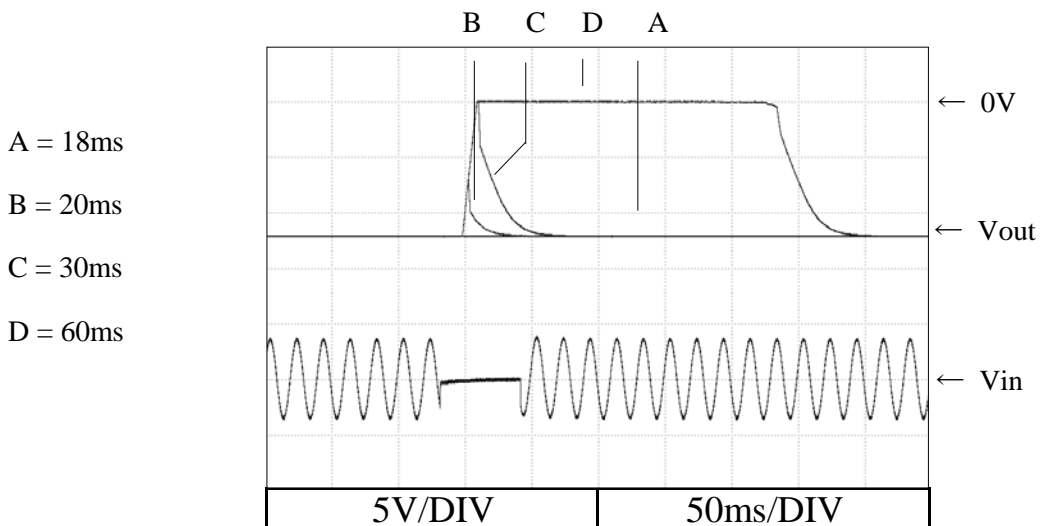
5V



12V



-12V



2.8 入力電圧瞬停特性

Response to brown out characteristics

Model: CUT35-522

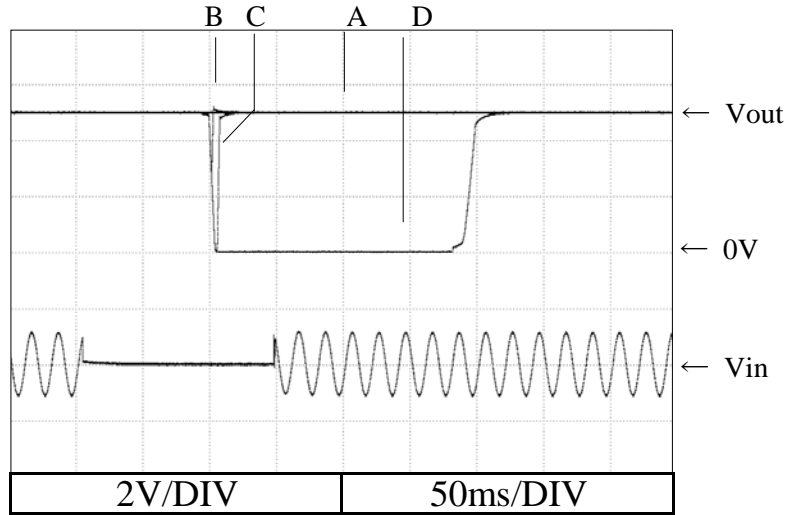
Conditions Vin : 200 VAC

Iout : 100 %

Ta : 25 °C

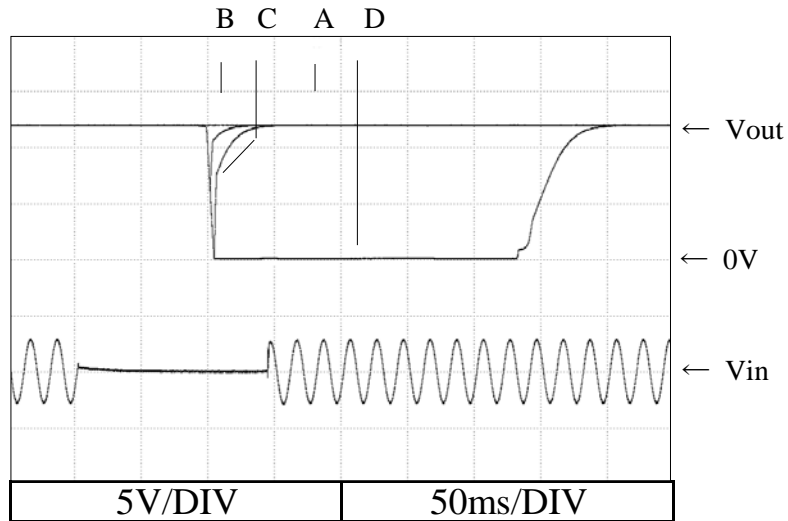
5V

A = 95ms
B = 102ms
C = 107ms
D = 143ms



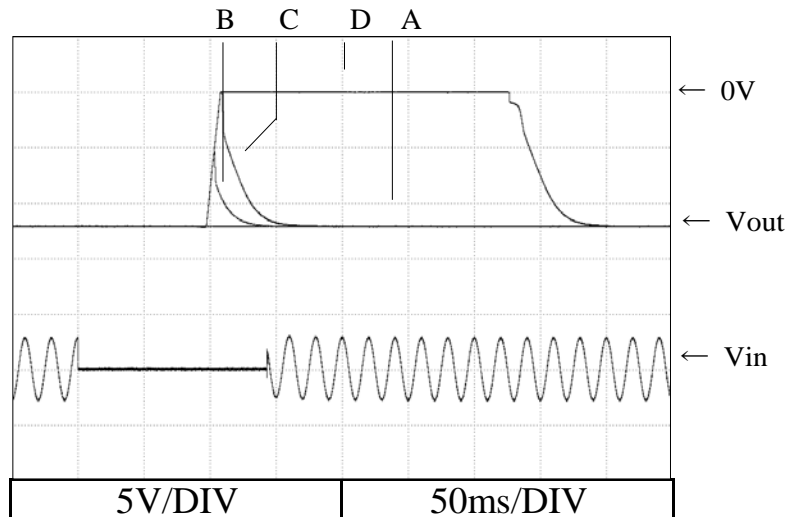
12V

A = 95ms
B = 102ms
C = 106ms
D = 142ms



-12V

A = 95ms
B = 105ms
C = 114ms
D = 143ms



2.8 入力電圧瞬停特性

Response to brown out characteristics

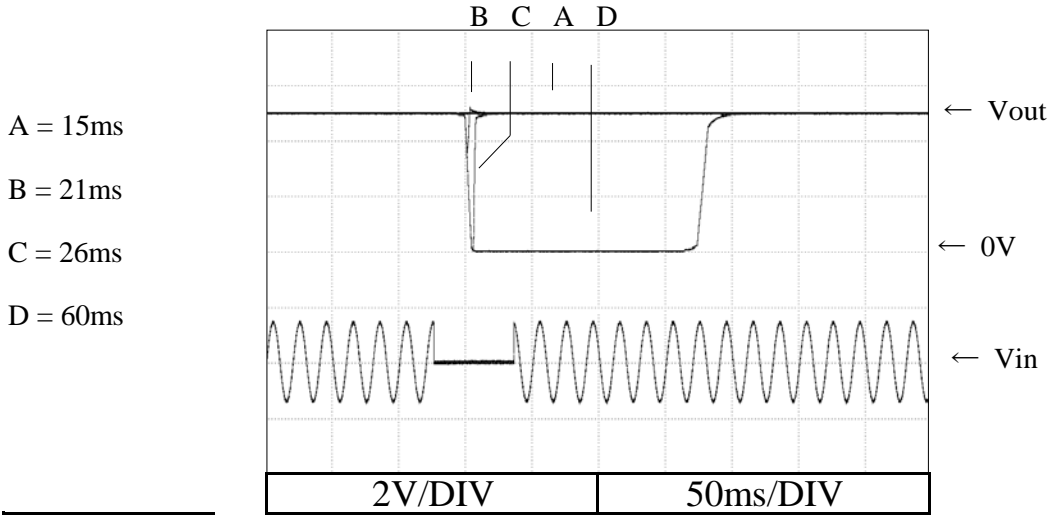
Model: CUT35-5FF

Conditions Vin : 100 VAC

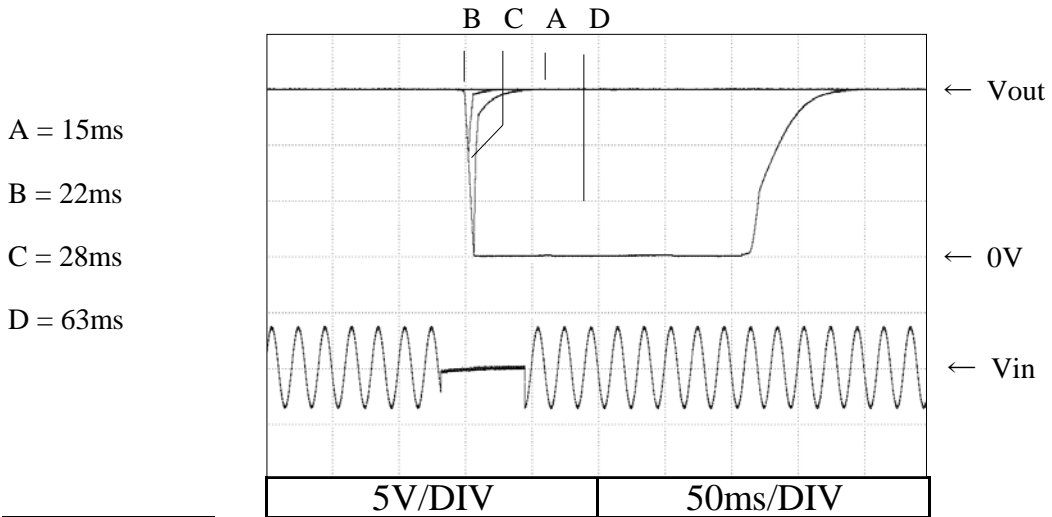
Iout : 100 %

Ta : 25 °C

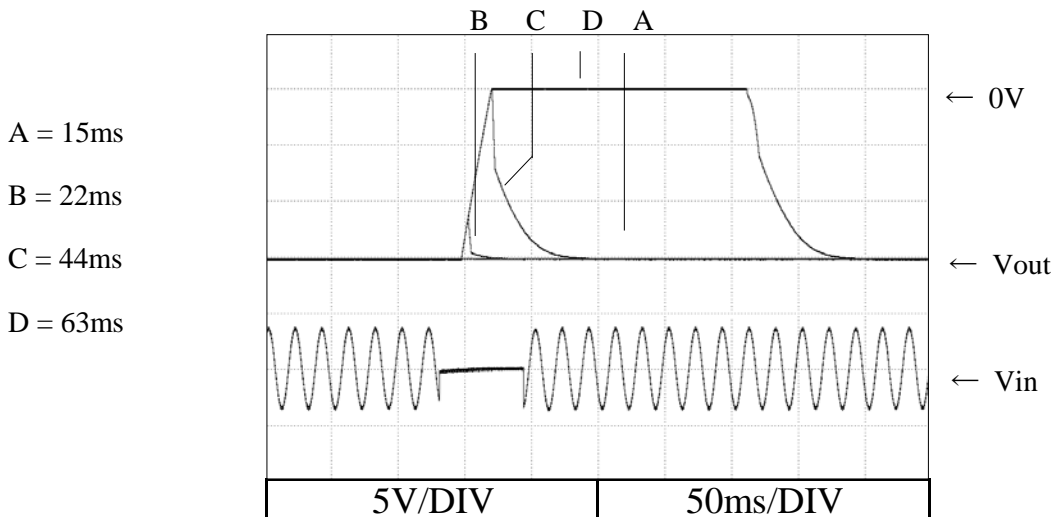
5V



15V



-15V



2.8 入力電圧瞬停特性

Response to brown out characteristics

Model: CUT35-5FF

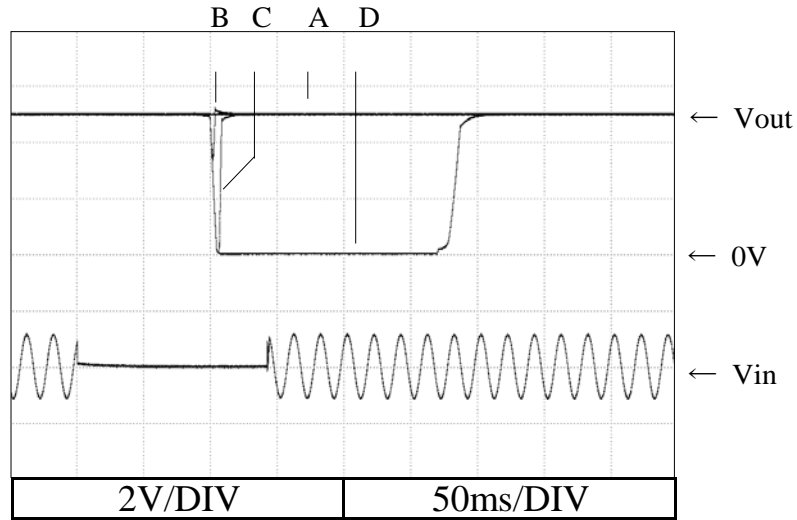
Conditions Vin : 200 VAC

Iout : 100 %

Ta : 25 °C

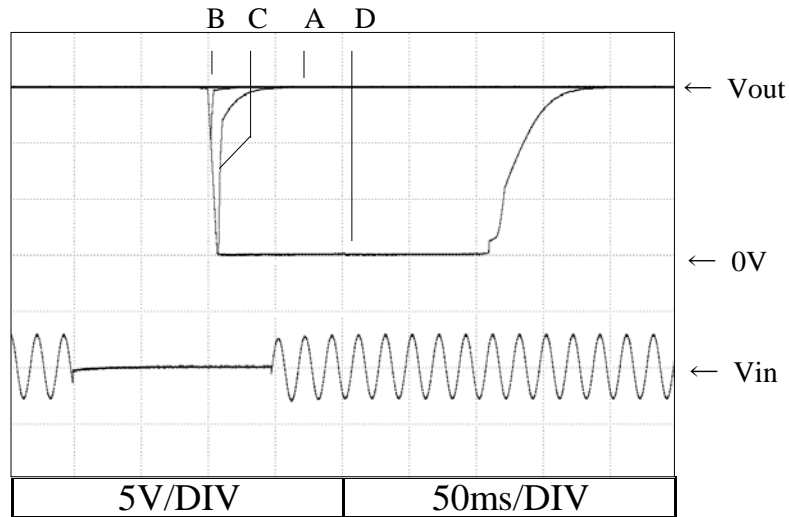
5V

- A = 98ms
- B = 103ms
- C = 108ms
- D = 142ms



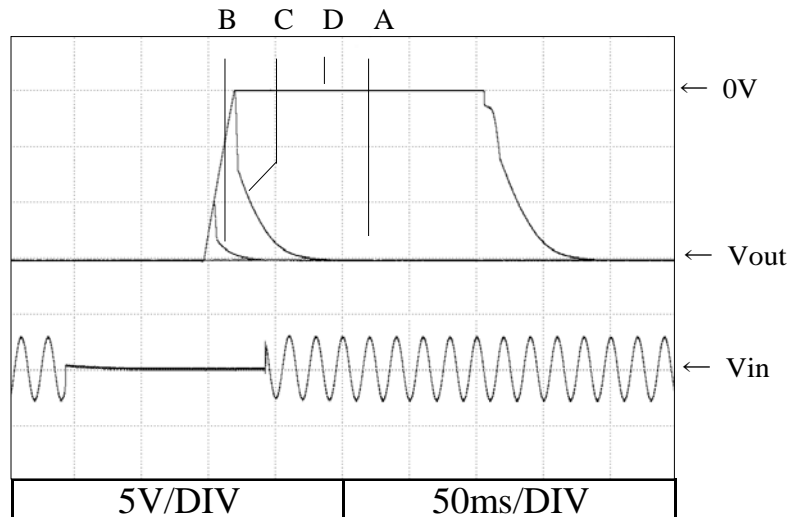
15V

- A = 98ms
- B = 106ms
- C = 113ms
- D = 148ms



-15V

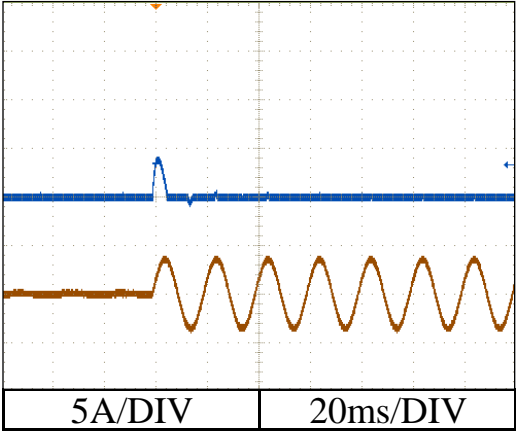
- A = 100ms
- B = 109ms
- C = 128ms
- D = 149ms



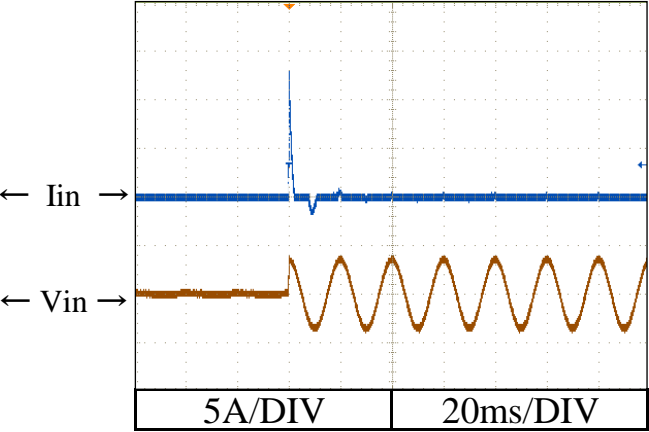
2.9 入力サージ電流 (突入電流) 波形
Inrush current waveform

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

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

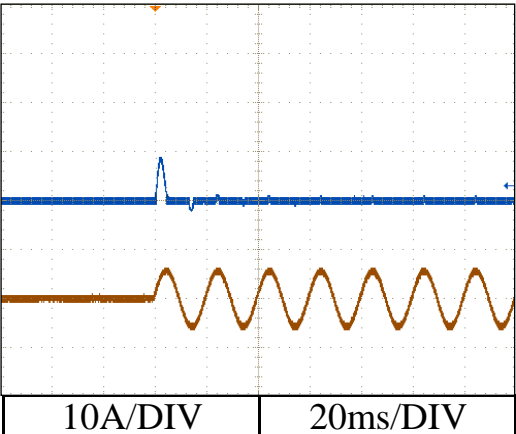


Switch on phase angle of input AC voltage
 $\phi = 90^\circ$

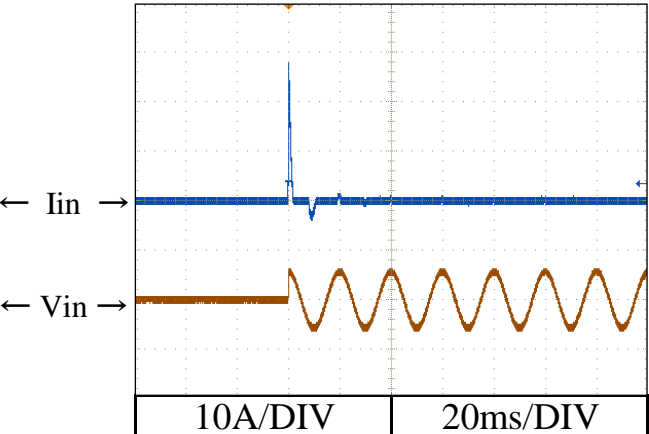


Conditions Vin : 200 VAC
Iout : 100 %
Ta : 25 °C

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



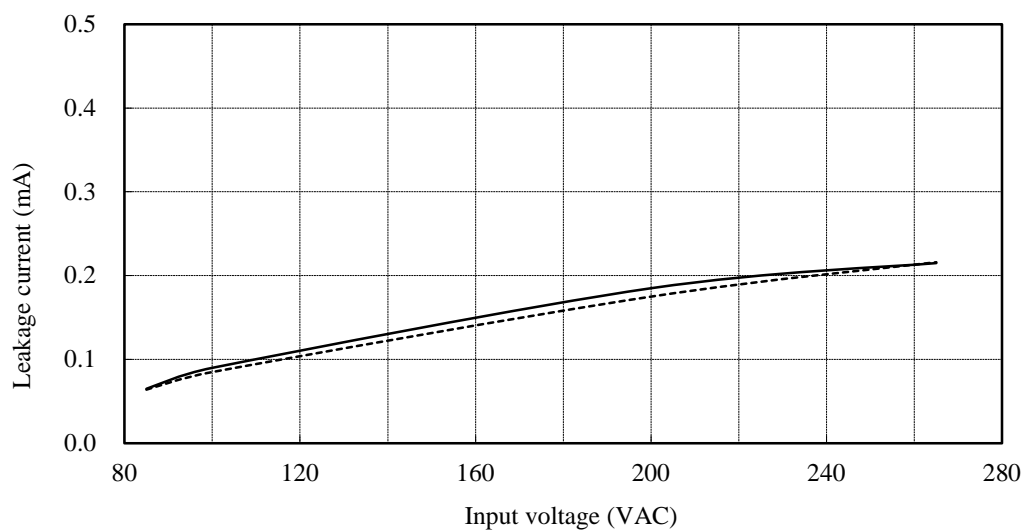
Switch on phase angle of input AC voltage
 $\phi = 90^\circ$



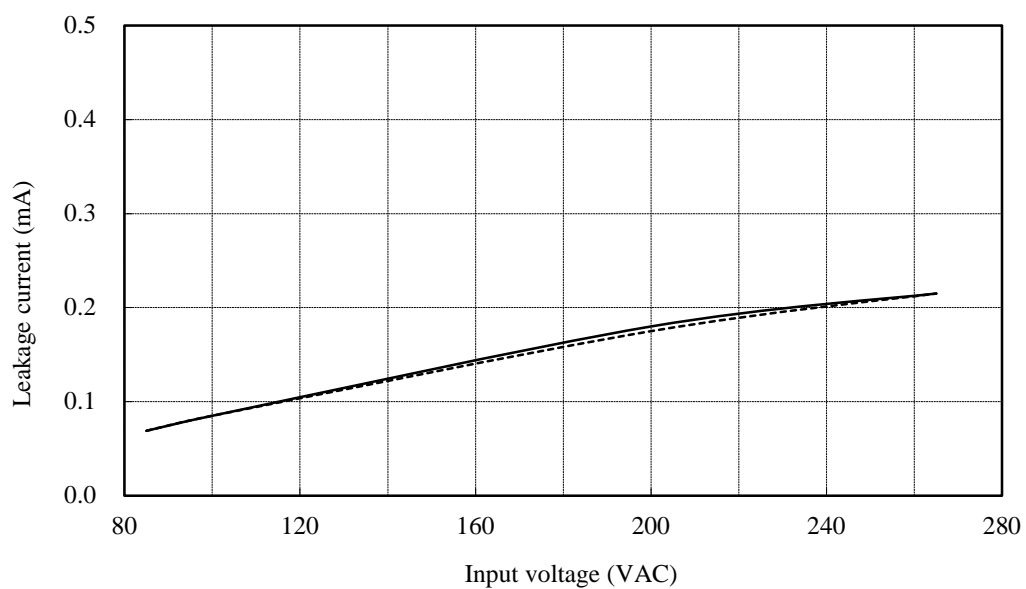
2.10 リーク電流特性
Leakage current characteristics

Conditions Iout : 0 % -----
 100 % ——
 Ta : 25 °C
 f : 50 Hz
 Equipment used : 3226 (Simpson)

L



N



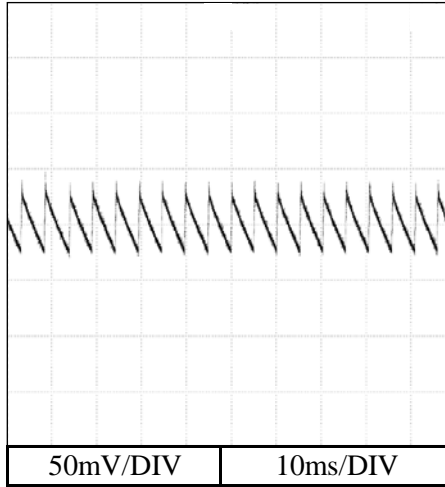
2.11 出力リップル、ノイズ波形
 Output ripple and noise waveform
 Model:CUT35-522

Conditions

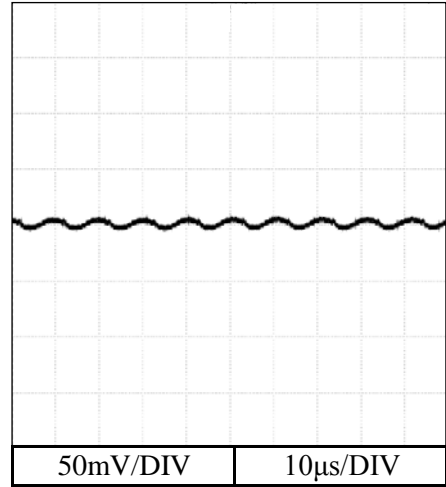
Vin : 100VAC
 Ta : 25°C

CH1:5V

Iout : 0%

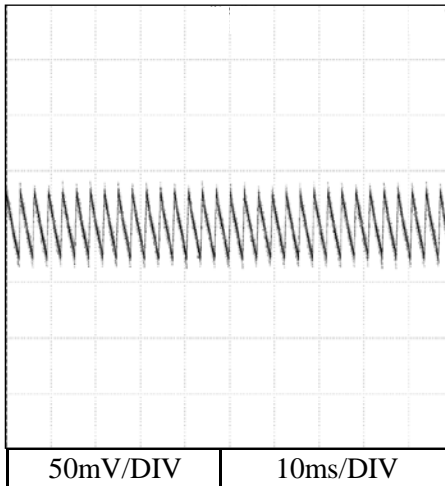


Iout : 100%

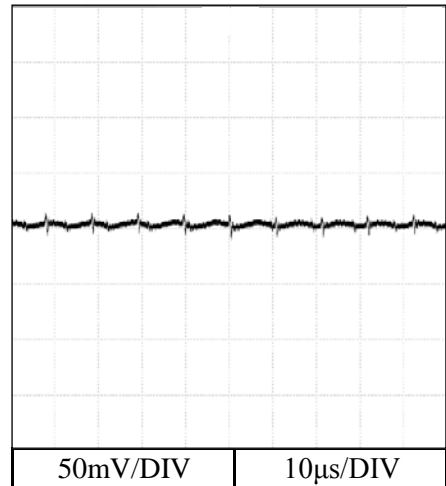


CH2:+12V

Iout : 0%

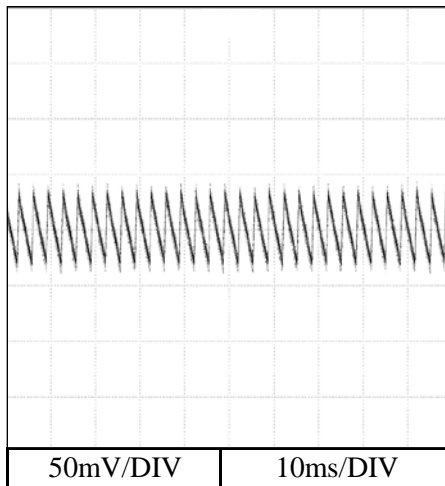


Iout : 100%

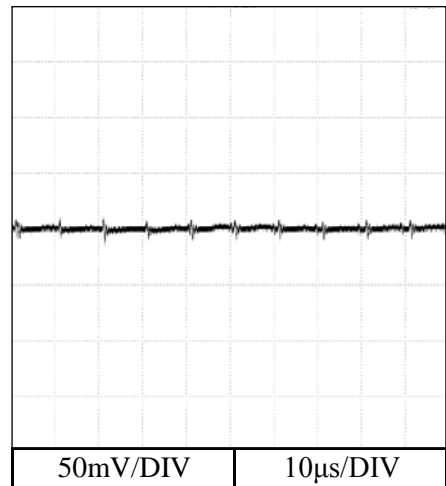


CH3:-12V

Iout : 0%

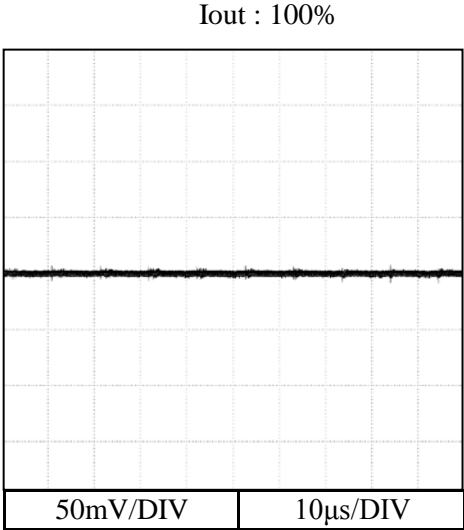
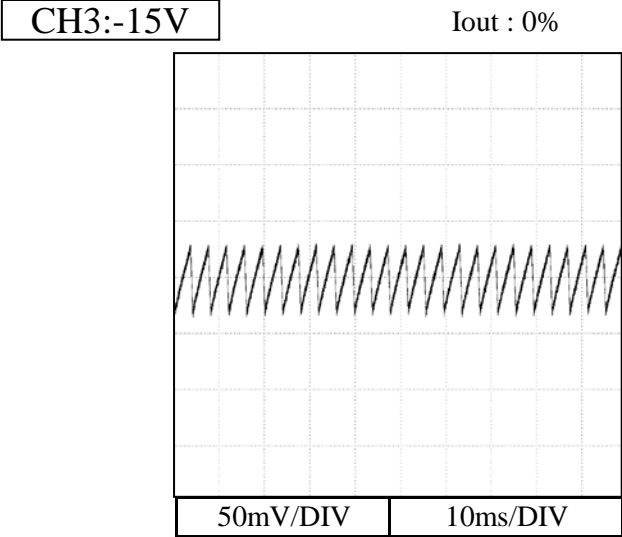
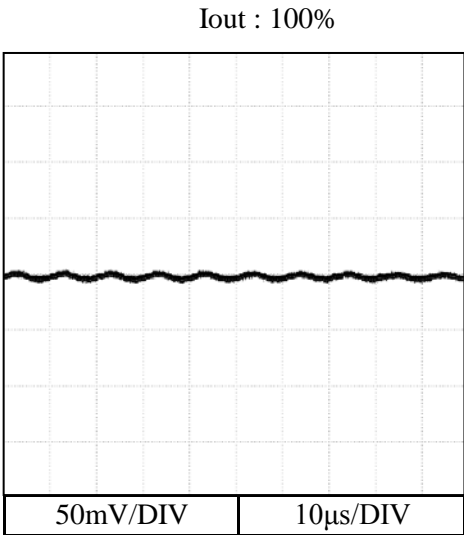
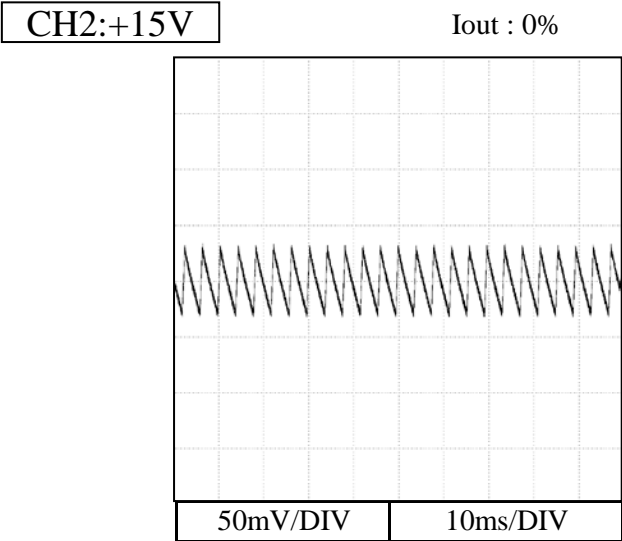
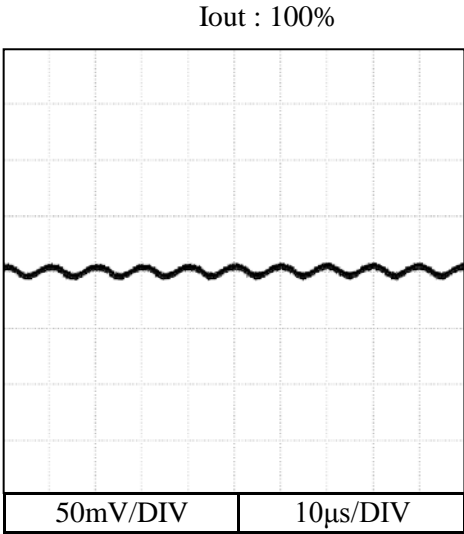
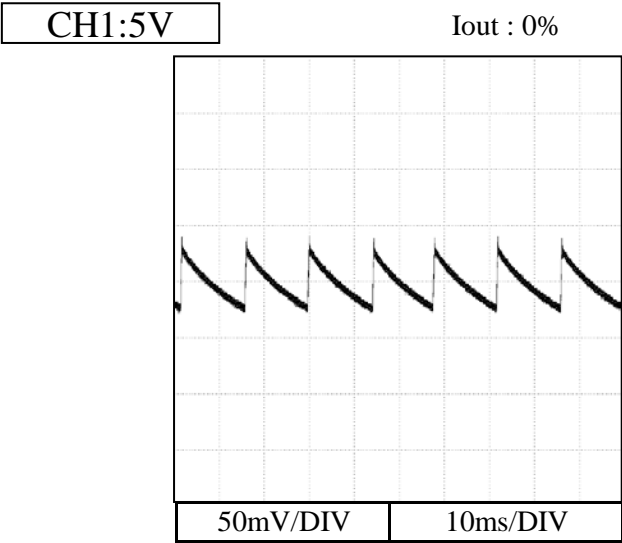


Iout : 100%



2.11 出力リップル、ノイズ波形
Output ripple and noise waveform
Model:CUT35-5FF

Conditions Vin : 100VAC
Ta : 25°C



2.12 EMI 特性

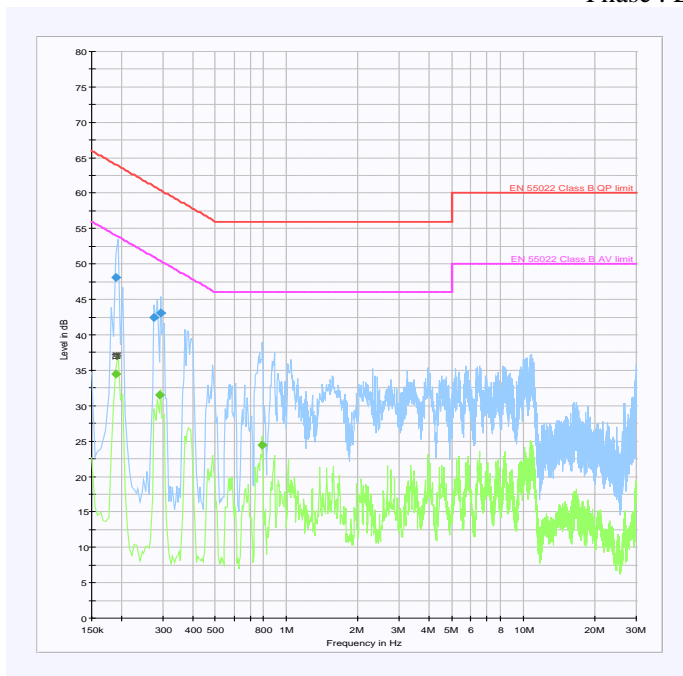
Electro-Magnetic Interference characteristics
 Model:CUT35-522

Conditions Vin : 230 VAC
 Iout : 100 %
 Ta : 25 °C

雑音端子電圧

Conducted Emission

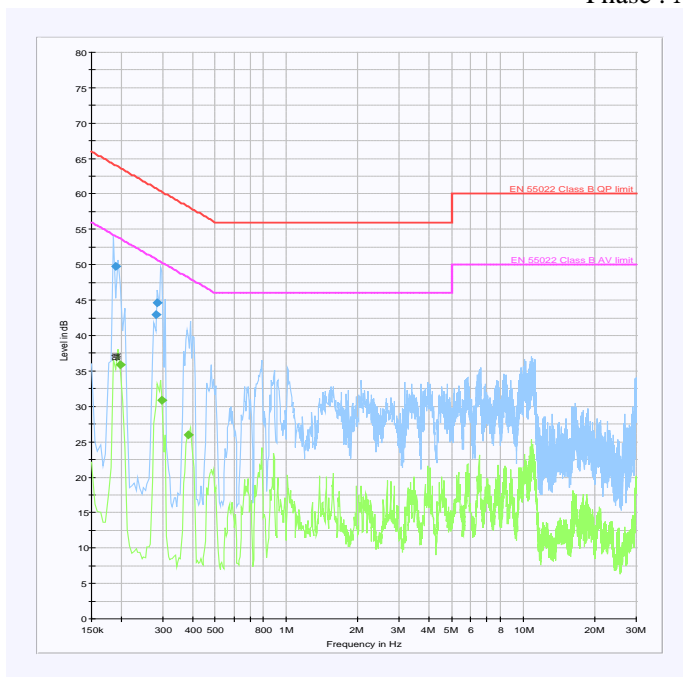
Phase : L



EN 55022 Class B
 QP Limit

EN 55022 Class B
 AV Limit

Phase : N



EN 55022 Class B
 QP Limit

EN 55022 Class B
 AV Limit

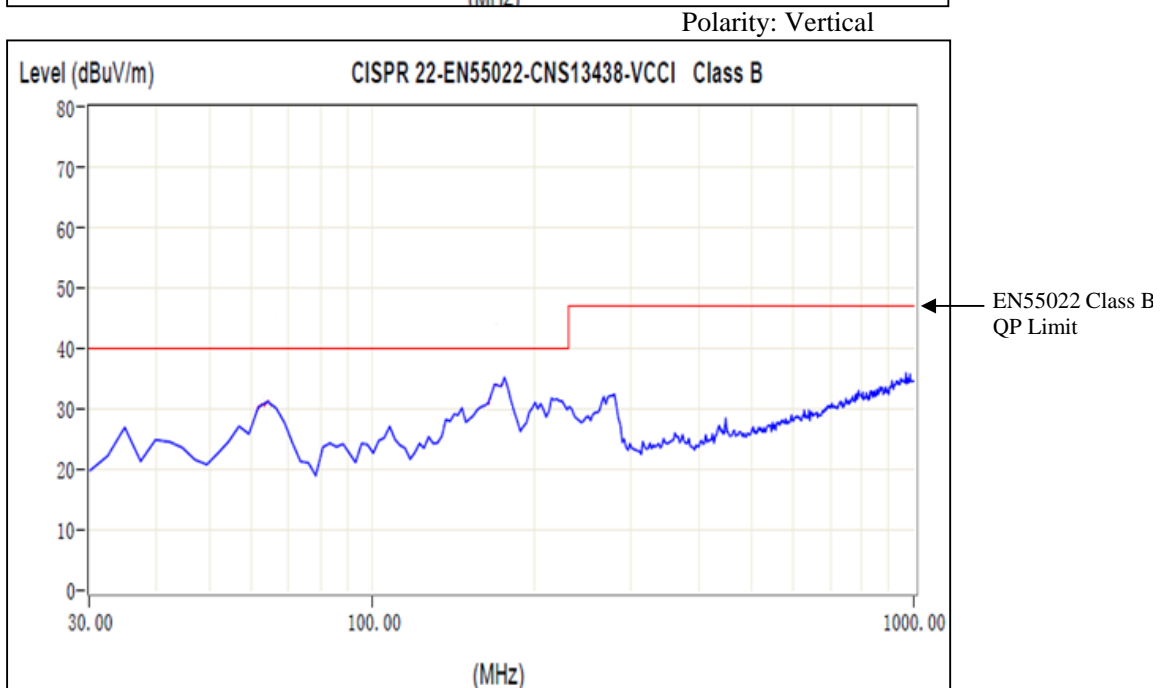
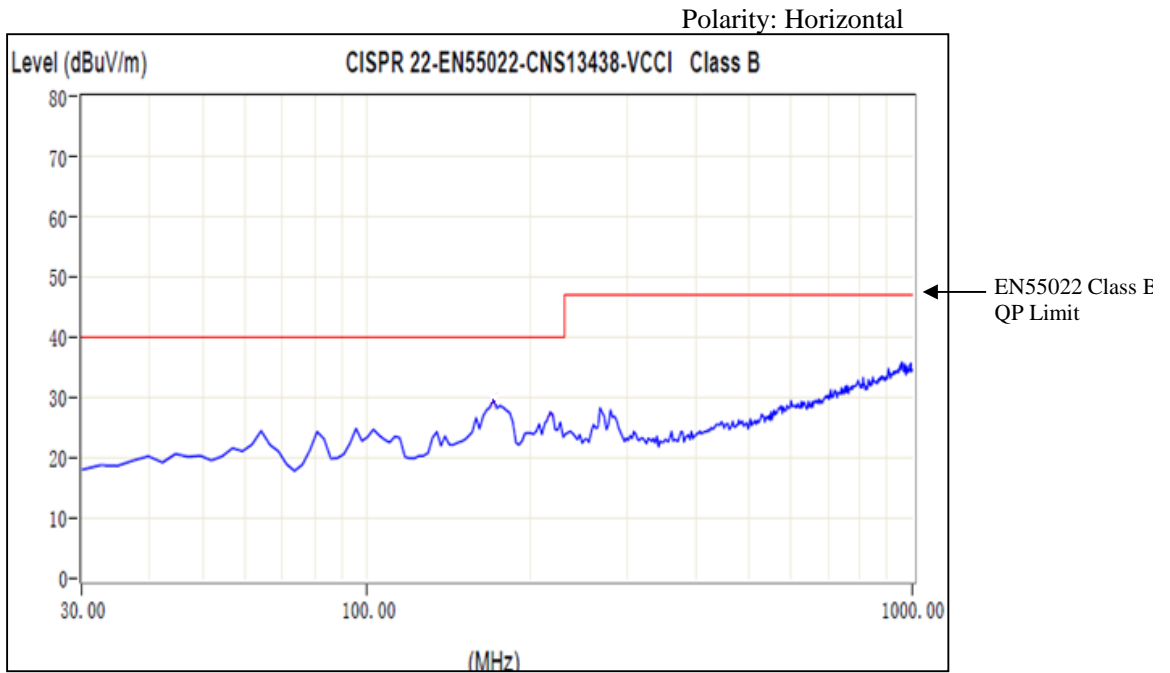
EN55011-B,VCCI-B,FCC-Bの限界値はEN55022 class Bの限界値と同じ
 Limit of EN55011-B,VCCI-B,FCC-B are same as its EN55022 class B.

2. 12 E M I 特性

Electro-Magnetic Interference characteristics
 Model: CUT35-522

Conditions Vin: 230VAC
 Io: 100%
 Ta: 25°C

雑音電界強度
 Radiated Emission



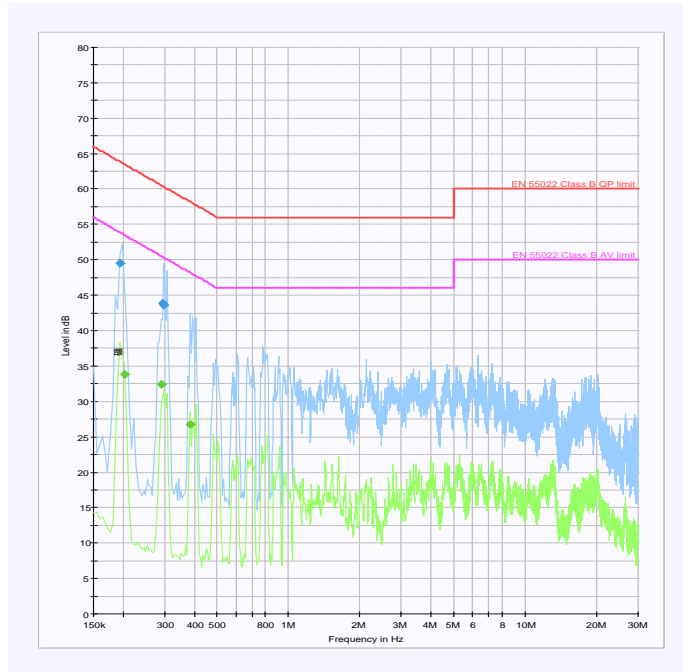
2.12 EMI 特性

Electro-Magnetic Interference characteristics
 Model:CUT35-5FF

Conditions Vin : 230 VAC
 Iout : 100 %
 Ta : 25 °C

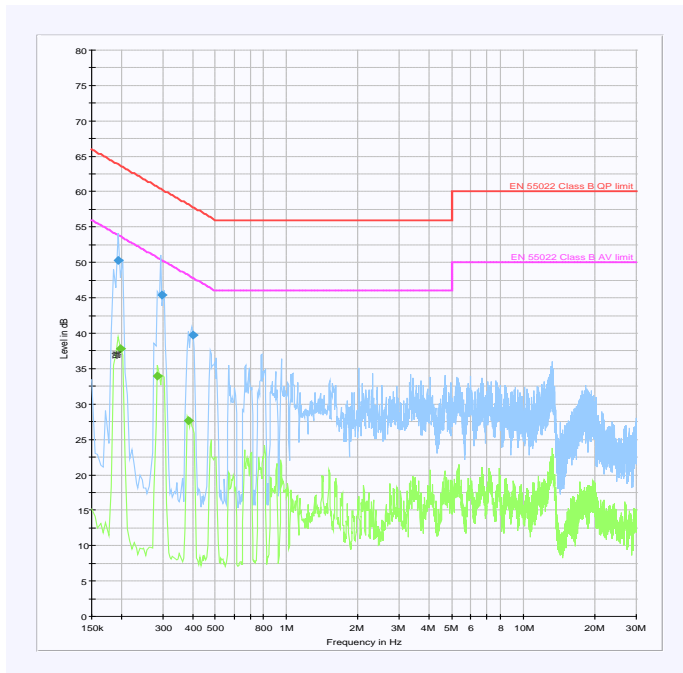
雑音端子電圧
 Conducted Emission

Phase : L



EN 55022 Class B
 QP Limit
 EN 55022 Class B
 AV Limit

Phase : N



EN 55022 Class B
 QP Limit
 EN 55022 Class B
 AV Limit

EN55011-B,VCCI-B,FCC-Bの限界値はEN55022 class Bの限界値と同じ
 Limit of EN55011-B,VCCI-B,FCC-B are same as its EN55022 class B.

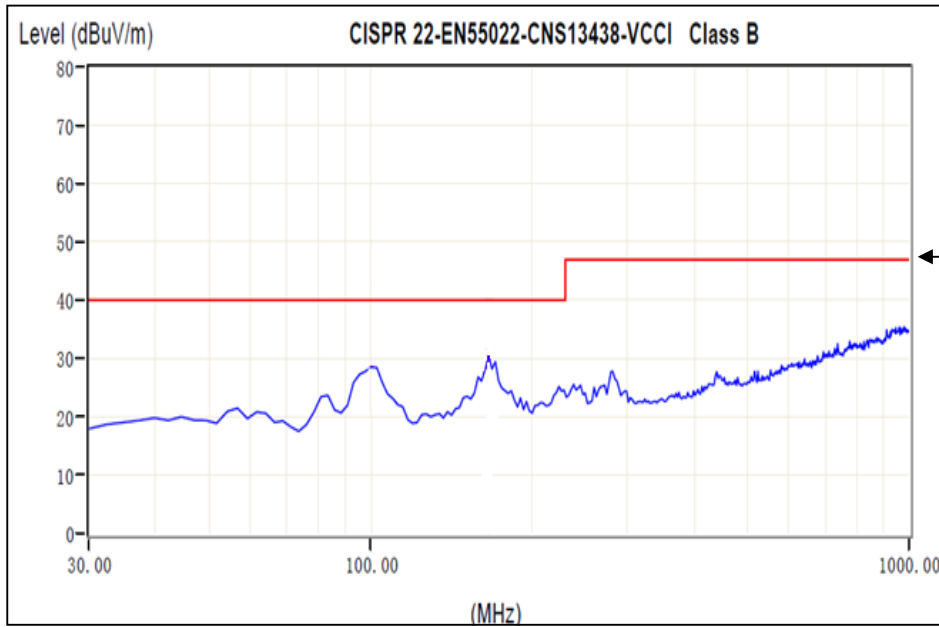
2.12 EMI 特性

Electro-Magnetic Interference characteristics
 Model: CUT35-5FF

Conditions Vin: 230VAC
 Io: 100%
 Ta: 25°C

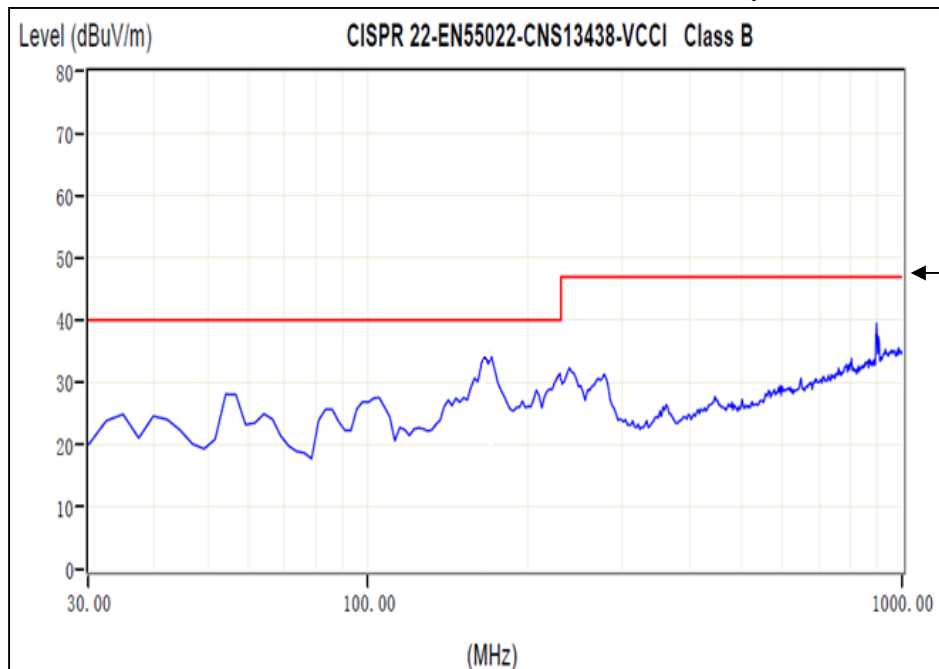
雑音電界強度
 Radiated Emission

Polarity: Horizontal



EN55022 Class B
 QP Limit

Polarity: Vertical



EN55022 Class B
 QP Limit