

# CUT75

## EVALUATION DATA

### 型式データ

DWG No. CA809-53-01		
APPD	CHK	DWG
Jackson 14-Feb-2014	Zick 13-Feb-14	Khong 12-Feb-'14

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使用記号 Terminology used

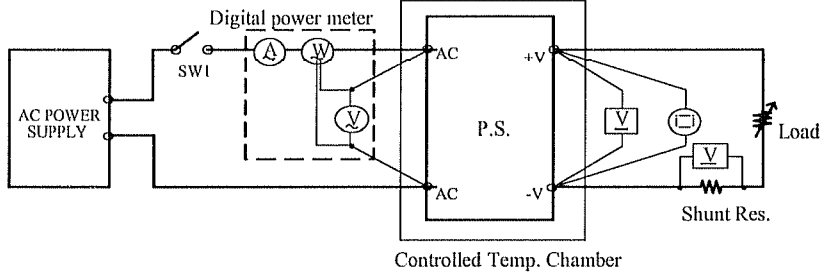
	定義	Definition
Vin	..... 入力電圧	Input voltage
Vout	..... 出力電圧	Output voltage
Iin	..... 入力電流	Input current
Iout	..... 出力電流	Output current
Ta	..... 周囲温度	Ambient temperature
f	..... 周波数	Frequency

1. 測定方法 Evaluation Method

1.1 測定回路 Circuit used for determination

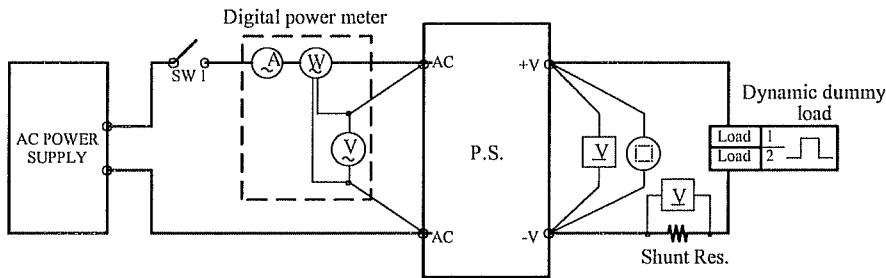
測定回路1 Circuit 1 used for determination

- ・ 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

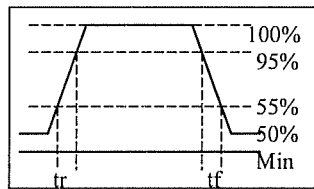


測定回路2 Circuit 2 used for determination

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

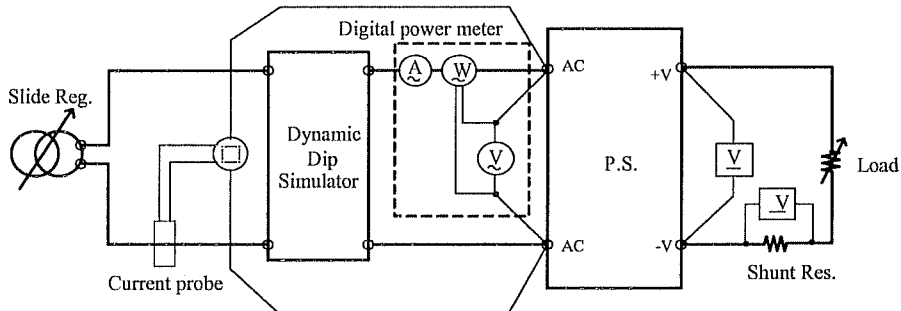


Output current waveform



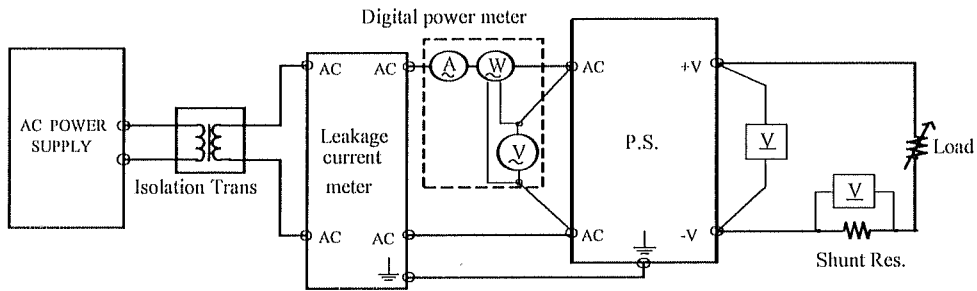
測定回路3 Circuit 3 used for determination

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



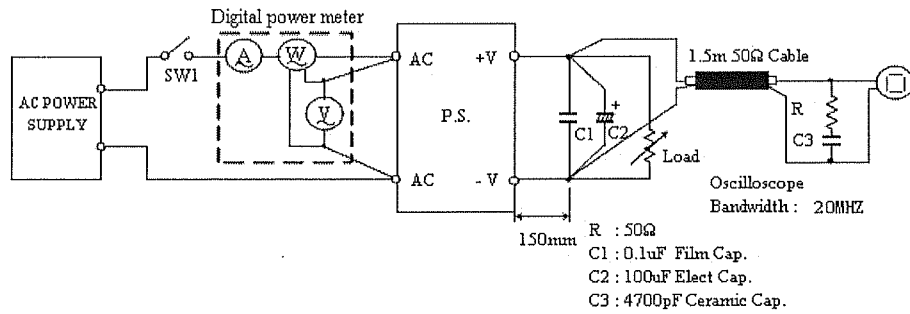
測定回路4 Circuit 4 used for determination

- ・リーク電流特性 Leakage current characteristics



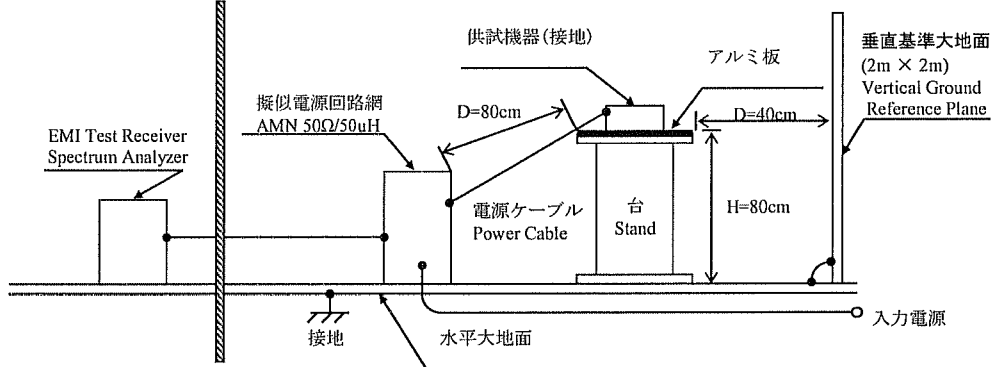
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- ・出力リップル、ノイズ波形 Output ripple and noise waveform

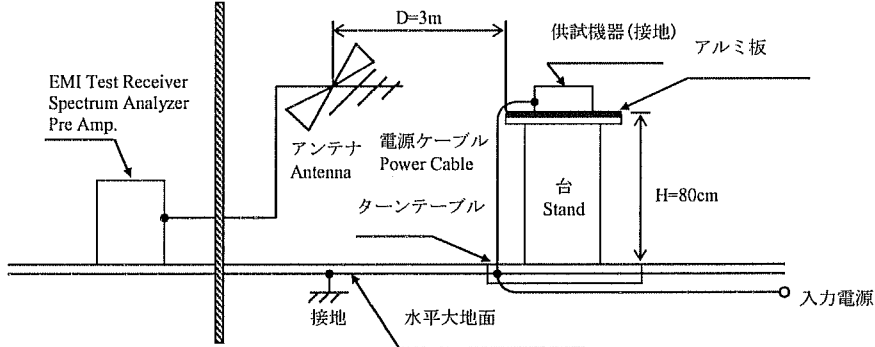


測定構成 Configuration used for determination

- ・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	TDS 540A
2	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DL1720E
3	DIGITAL MULTIMETER	FLUKE	45
4	DIGITAL POWER METER	YOKOGAWA ELECT.	WT210
5	CURRENT PROBE	TEKTRONIX	63202
6	DC AMPERE METER	TEKTRONIX	P5100
7	DYNAMIC DUMMY LOAD	CHROMA	63030
8	CVCF	KIKUSUI	PCR2000L
9	LEAKAGE CURRENT METER	SIMPSON	3226
10	CONTROLLED TEMP. CHAMBER	TABAI-ESPEC	63203
11	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCI-03
12	LISN	ROHDE & SCHWARZ	ENV216
13	BICONICAL ANTENNA	EMCO	63208

## 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:CUT75-522

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

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	5.031V	5.031V	5.031V	5.031V	0mV	0.000%
50%	5.029V	5.029V	5.029V	5.029V	0mV	0.000%
100%	5.026V	5.026V	5.027V	5.027V	1mV	0.020%
load	5mV	5mV	4mV	4mV		
regulation	0.100%	0.100%	0.080%	0.080%		

2. Temperature drift

Conditions Vin: 100 VAC

Iout: 100 %

Ta	-20°C	+25°C	+50°C	temperature stability	
Vout	5.033V	5.026V	5.027V	7mV	0.140%

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

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	12.075V	12.085V	12.113V	12.118V	43mV	0.358%
50%	11.878V	11.880V	11.886V	11.888V	10mV	0.083%
100%	11.766V	11.776V	11.806V	11.813V	47mV	0.392%
load	309mV	309mV	307mV	305mV		
regulation	2.575%	2.575%	2.558%	2.542%		

2. Temperature drift

Conditions Vin: 100 VAC

Iout: 100 %

Ta	-20°C	+25°C	+50°C	temperature stability	
Vout	11.813V	11.776V	11.779V	37mV	0.308%

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

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	-12.282V	-12.273V	-12.281V	-12.275V	9mV	-0.075%
50%	-12.187V	-12.177V	-12.151V	-12.146V	41mV	-0.342%
100%	-12.152V	-12.142V	-12.111V	-12.104V	48mV	-0.400%
load	130mV	131mV	170mV	171mV		
regulation	-1.083%	-1.092%	-1.417%	-1.425%		

2. Temperature drift

Conditions Vin: 100 VAC

Iout: 100 %

Ta	-20°C	+25°C	+50°C	temperature stability	
Vout	-12.078V	-12.142V	-12.142V	64mV	-0.533%

3. Start up voltage and Drop out voltage

Conditions Ta: 25 °C

Iout: 100 %

Start up voltage (Vin)	74VAC
Drop out voltage (Vin)	58VAC

## 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:CUT75-5FF

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

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	5.031V	5.031V	5.031V	5.031V	0mV	0.000%
50%	5.030V	5.030V	5.031V	5.031V	1mV	0.020%
100%	5.027V	5.028V	5.028V	5.029V	2mV	0.040%
load	4mV	3mV	3mV	2mV		
regulation	0.080%	0.060%	0.060%	0.040%		

2. Temperature drift

Conditions Vin: 100 VAC

Iout: 100 %

Ta	-20°C	+25°C	+50°C	temperature stability	
Vout	5.020V	5.028V	5.031V	11mV	0.220%

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

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	15.361V	15.372V	15.422V	15.427V	66mV	0.440%
50%	15.128V	15.131V	15.136V	15.139V	11mV	0.073%
100%	15.014V	15.025V	15.053V	15.057V	43mV	0.287%
load	347mV	347mV	369mV	370mV		
regulation	2.313%	2.313%	2.460%	2.467%		

2. Temperature drift

Conditions Vin: 100 VAC

Iout: 100 %

Ta	-20°C	+25°C	+50°C	temperature stability	
Vout	15.045V	15.025V	15.025V	20mV	0.133%

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

Iout \ Vin	85VAC	100VAC	200VAC	265VAC	line regulation	
0%	-15.591V	-15.570V	-15.563V	-15.568V	28mV	-0.187%
50%	-15.490V	-15.476V	-15.453V	-15.450V	40mV	-0.267%
100%	-15.451V	-15.440V	-15.412V	-15.407V	44mV	-0.293%
load	140mV	130mV	151mV	161mV		
regulation	-0.933%	-0.867%	-1.007%	-1.073%		

2. Temperature drift

Conditions Vin: 100 VAC

Iout: 100 %

Ta	-20°C	+25°C	+50°C	temperature stability	
Vout	-15.403V	-15.440V	-15.442V	39mV	-0.260%

3. Start up voltage and Drop out voltage

Conditions Ta: 25 °C

Iout: 100 %

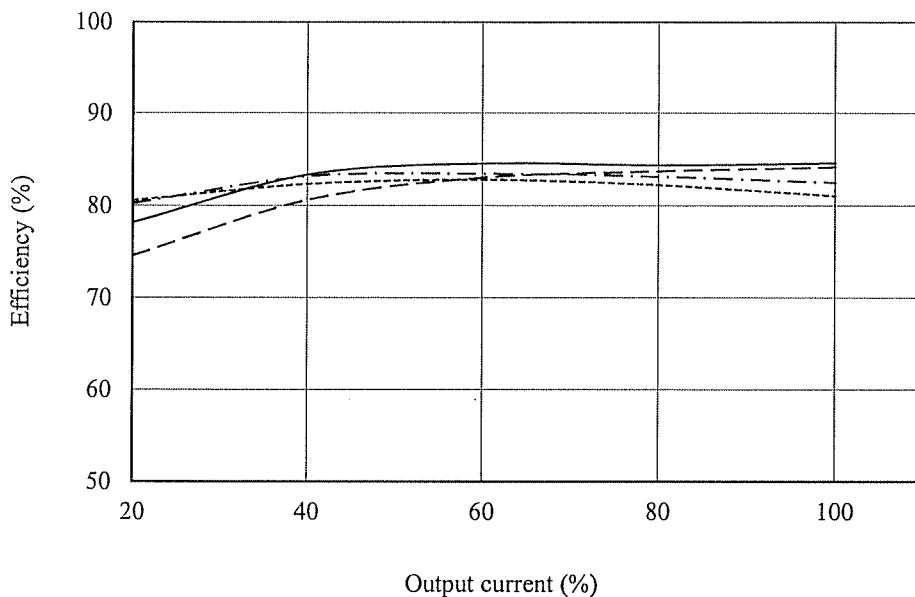
Start up voltage (Vin)	73VAC
Drop out voltage (Vin)	58VAC



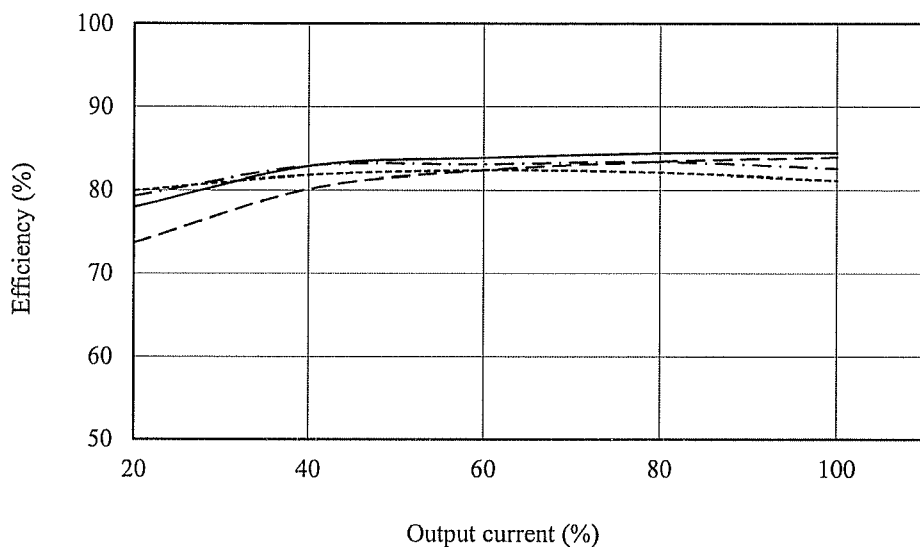
(2) 効率対出力電流

Efficiency vs. Output current  
Model: CUT75-522

Conditions  $V_{in}$  : 85 VAC -----  
 : 100 VAC - - - - -  
 : 200 VAC ————  
 : 265 VAC - - - - -  
 $T_a$  : 25 °C



Model: CUT75-5FF

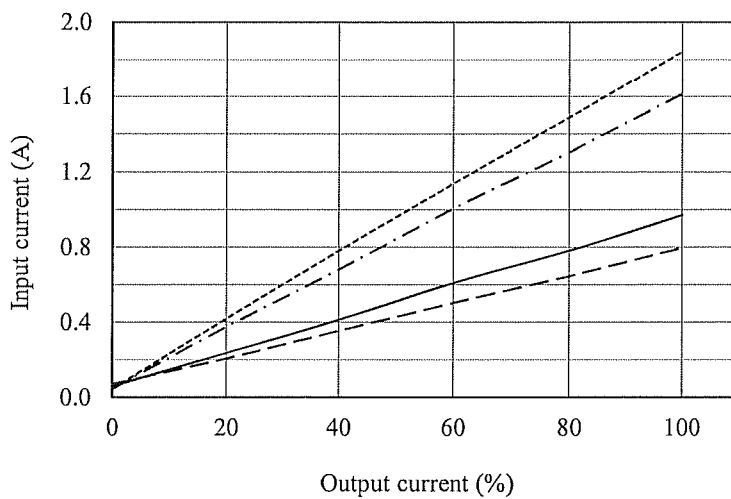


(3) 入力電流対出力電流

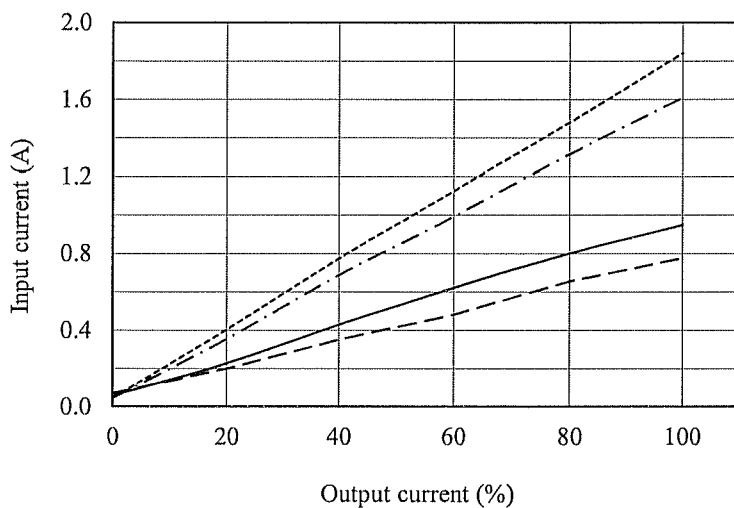
Input current vs. Output current

Model:CUT75-522

Conditions  $V_{in}$  : 85 VAC -----  
 : 100 VAC -.-.-.-  
 : 200 VAC ————  
 : 265 VAC - - - - -  
 $T_a$  : 25 °C



Model:CUT75-5FF

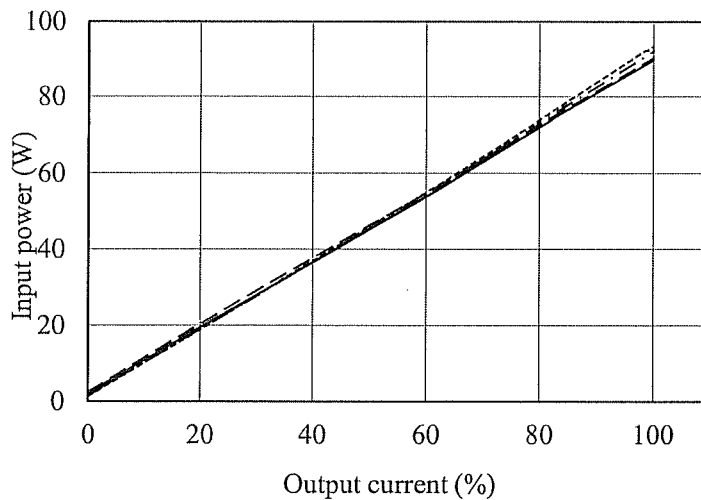


(4) 入力電力対出力電流

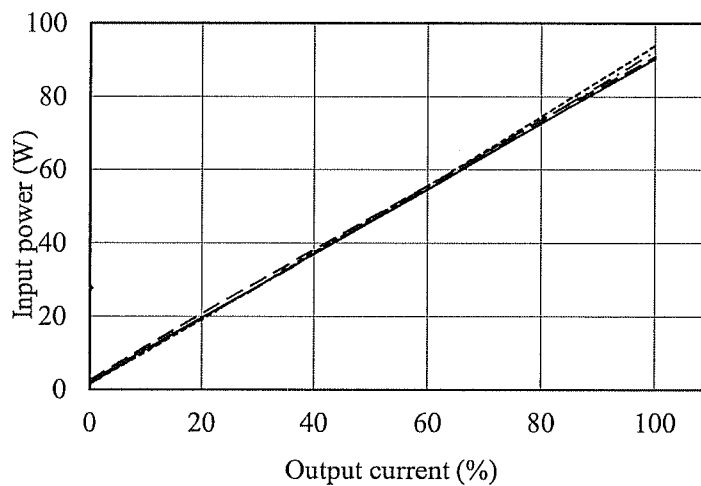
Input power vs. Output current

Model: CUT75-522

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



Model: CUT75-5FF



2.2 過電流保護特性

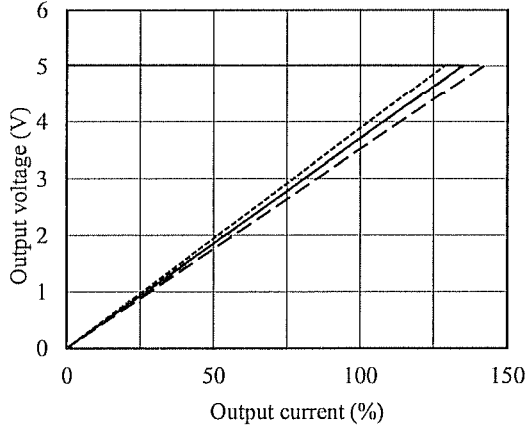
Over current protection (OCP) characteristics

Model: CUT75-522

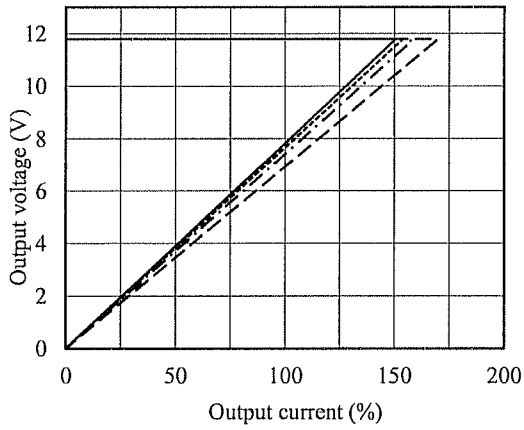
Conditions Vin : 85 VAC -----  
 100 VAC .....  
 200 VAC ————  
 265 VAC - - - - -

Ta : 25 °C

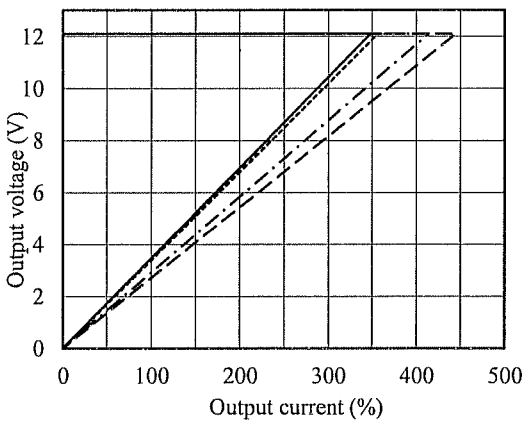
CH1: 5V



CH2: +12V



CH3: -12V

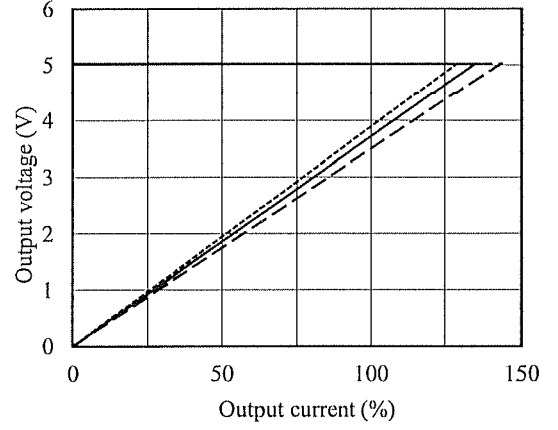


Model: CUT75-5FF

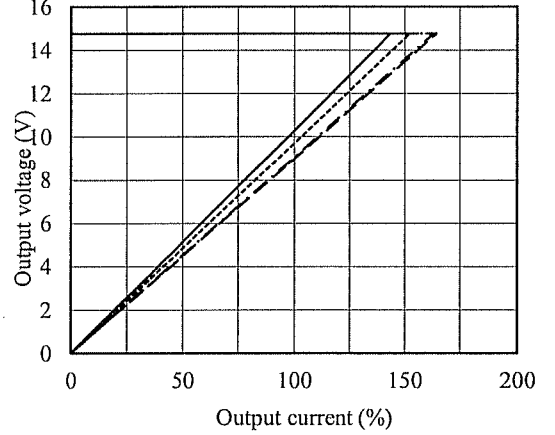
Conditions Vin : 85 VAC -----  
 100 VAC .....  
 200 VAC ————  
 265 VAC - - - - -

Ta : 25 °C

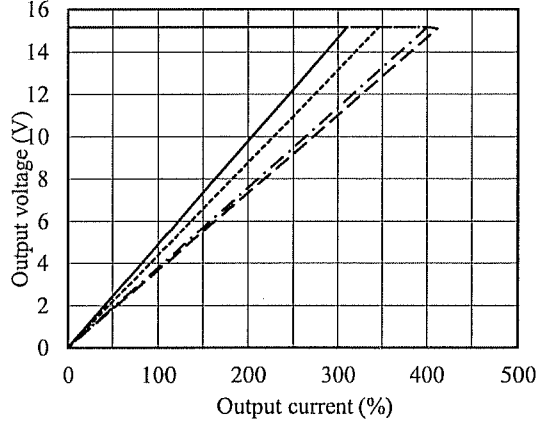
CH1: 5V



CH2: +15V



CH3: -15V

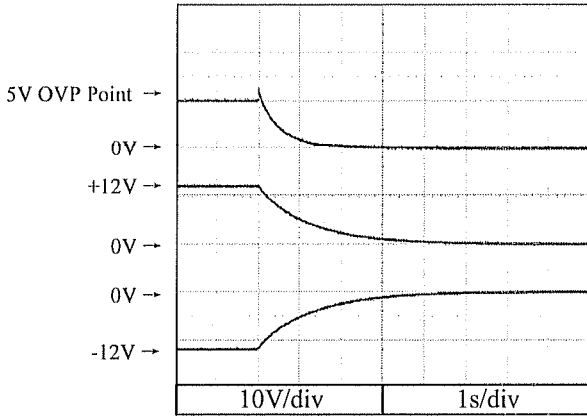


2.3 過電圧保護特性

Over voltage protection (OVP) characteristics

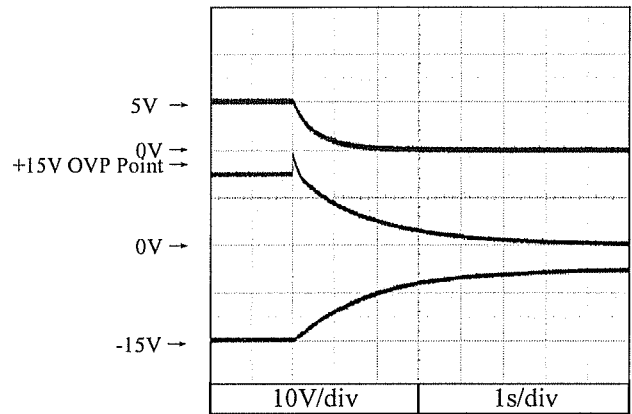
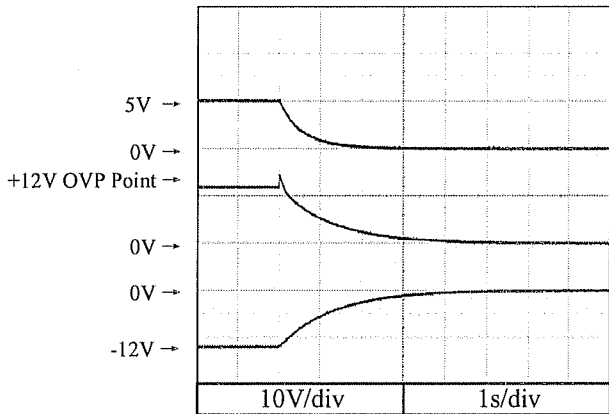
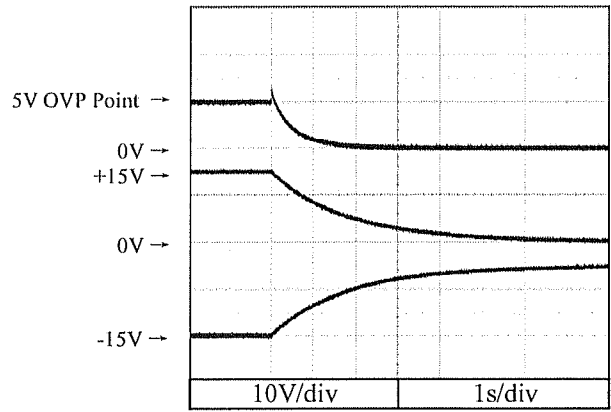
Model: CUT75-522

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



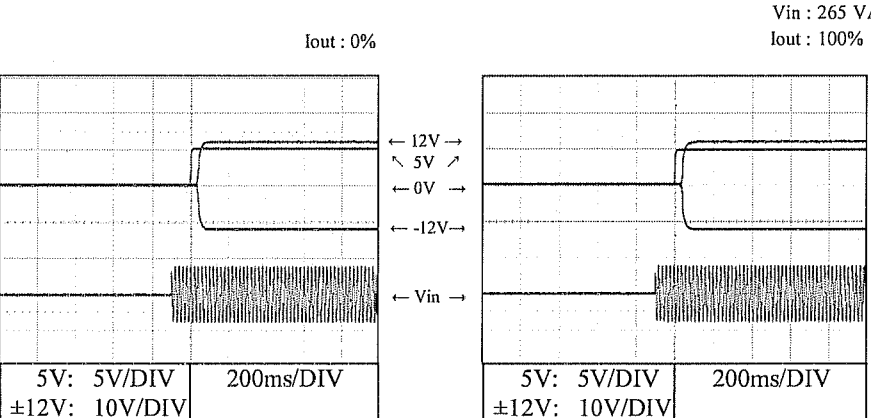
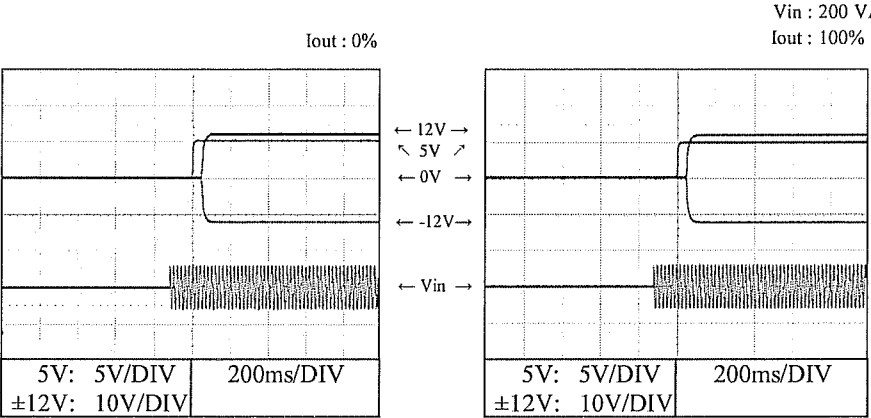
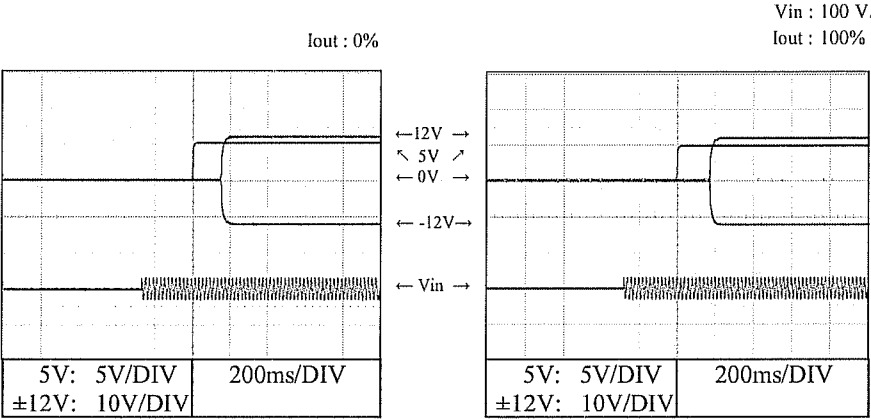
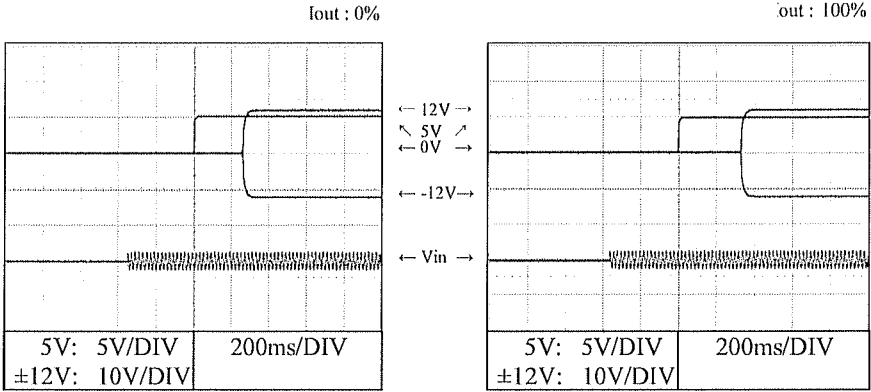
Model: CUT75-5FF

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



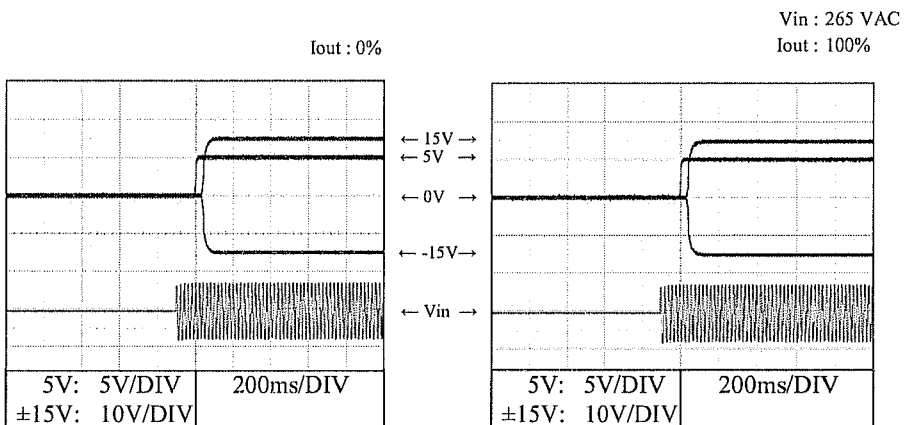
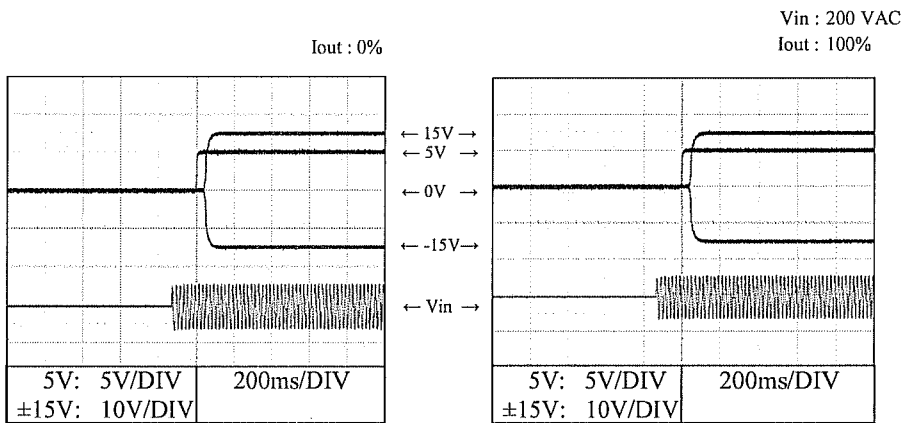
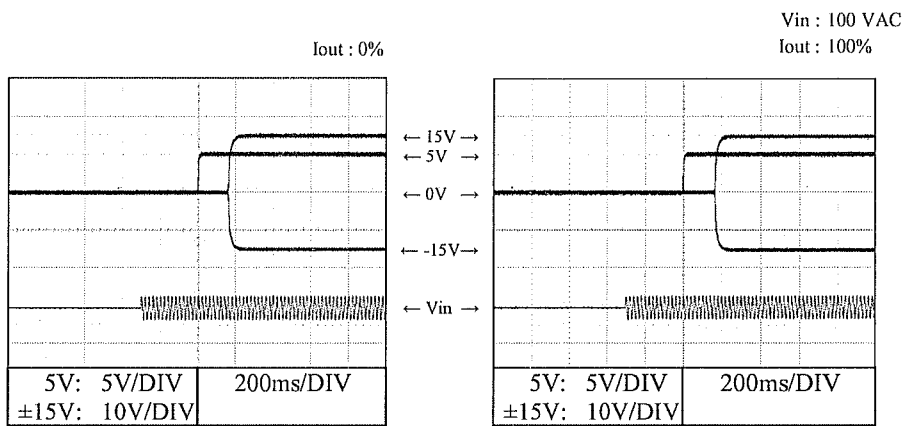
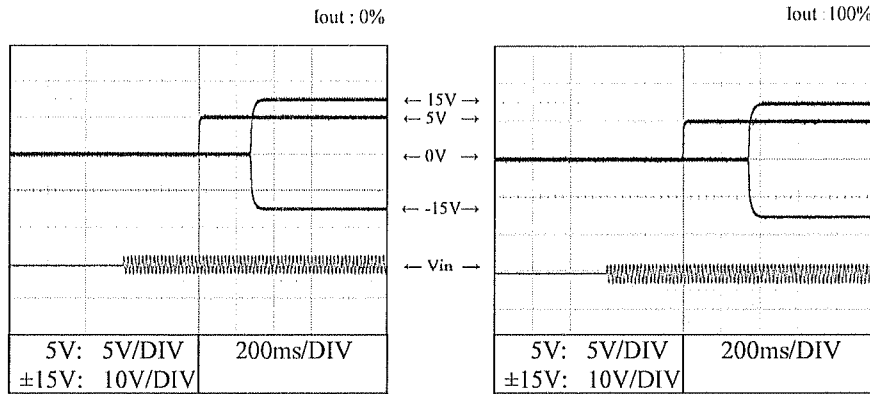
2.4 出力立ち上がり特性  
Output rise characteristics  
Model: CUT75-522

Conditions Ta : 25 °C  
Vin : 85 VAC  
Iout : 100%



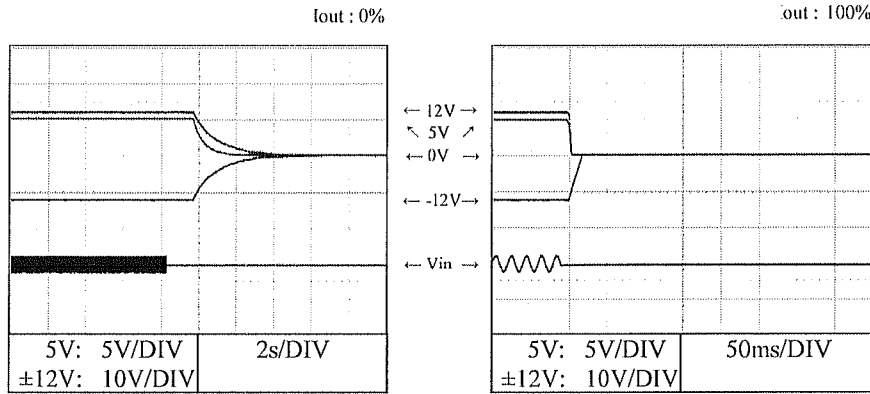
2.4 出力立ち上がり特性  
 Output rise characteristics  
 Model: CUT75-5FF

Conditions Ta : 25 °C  
 Vin : 85 VAC  
 Iout : 100%

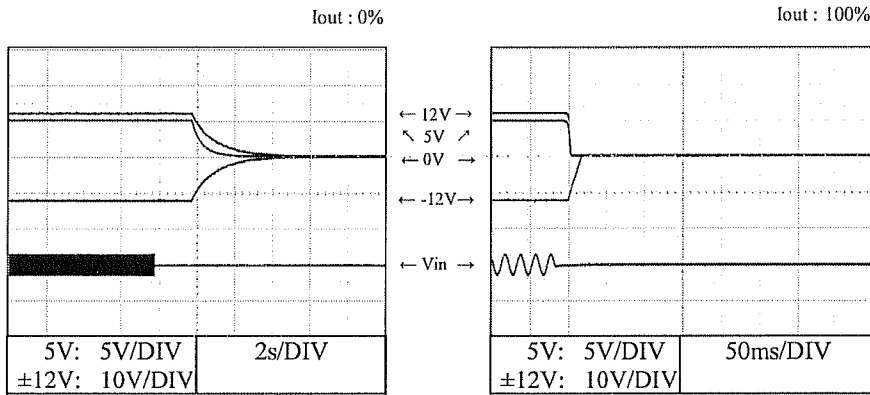


2.5 出力立ち下がり特性  
 Output fall characteristics  
 Model: CUT75-522

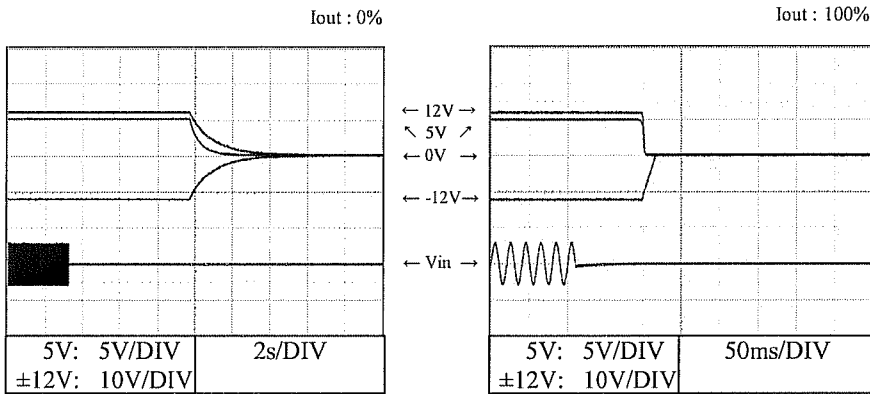
Conditions Ta : 25 °C  
 Vin : 85 VAC  
 Iout : 100%



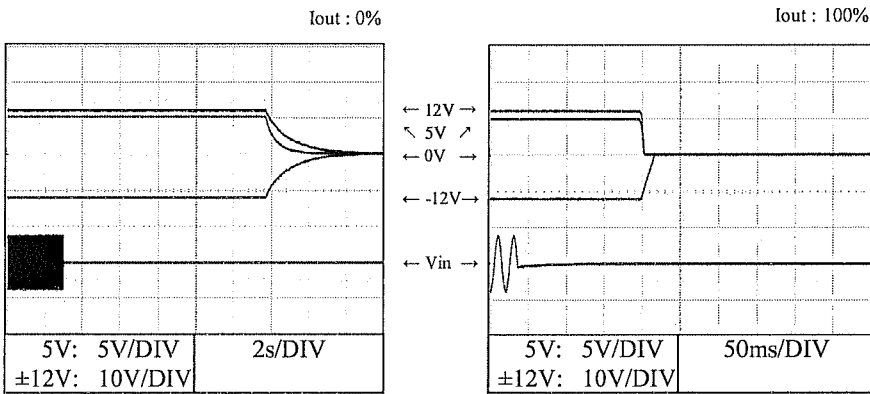
Vin : 100 VAC  
 Iout : 100%



Vin : 200 VAC  
 Iout : 100%



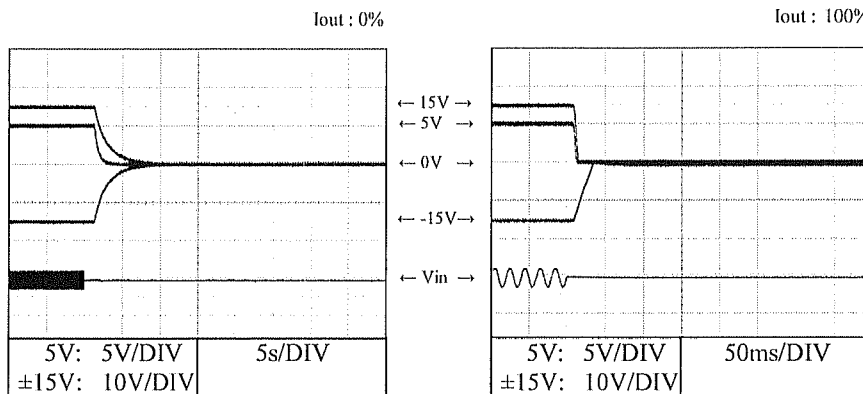
Vin : 265 VAC  
 Iout : 100%



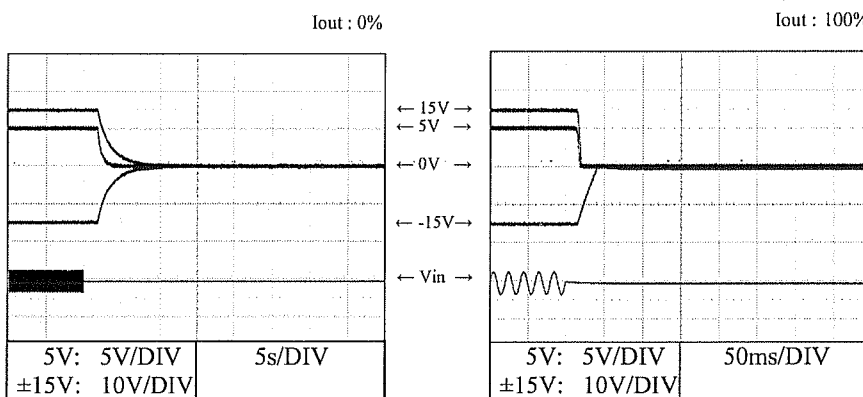


2.5 出力立ち下がり特性  
 Output fall characteristics  
 Model: CUT75-5FF

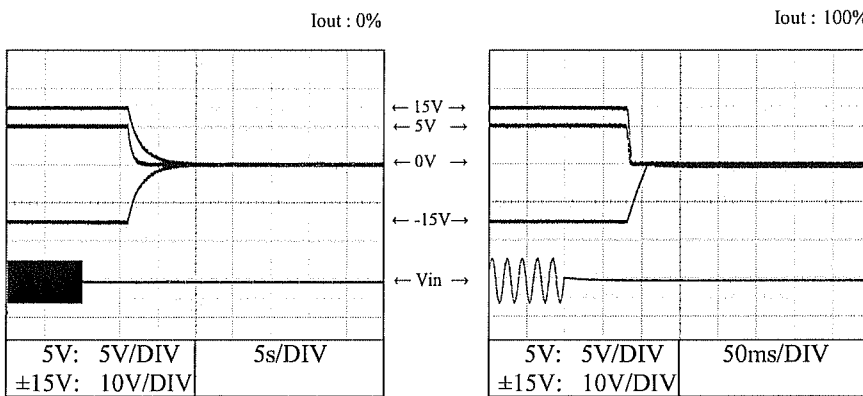
Conditions Ta : 25 °C  
 Vin : 85 VAC  
 Iout : 100%



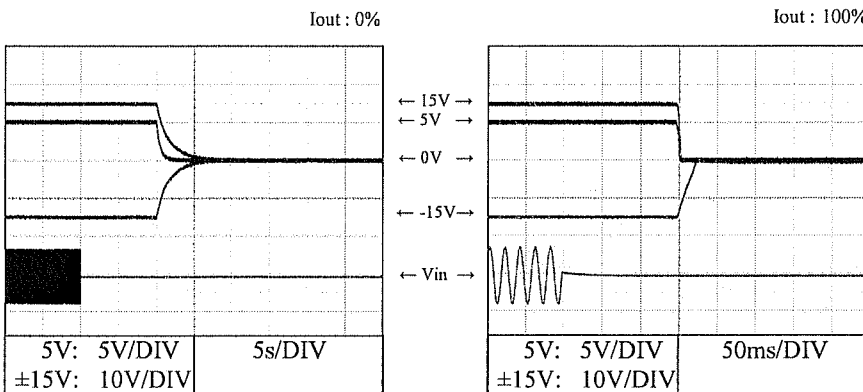
Vin : 100 VAC  
 Iout : 100%



Vin : 200 VAC  
 Iout : 100%



Vin : 265 VAC  
 Iout : 100%

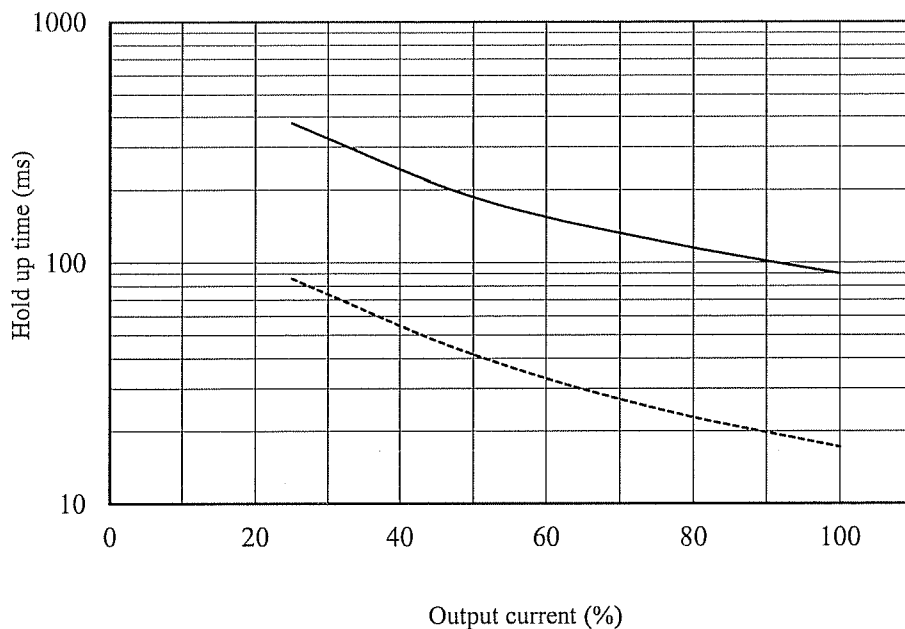


2.6 出力保持時間特性

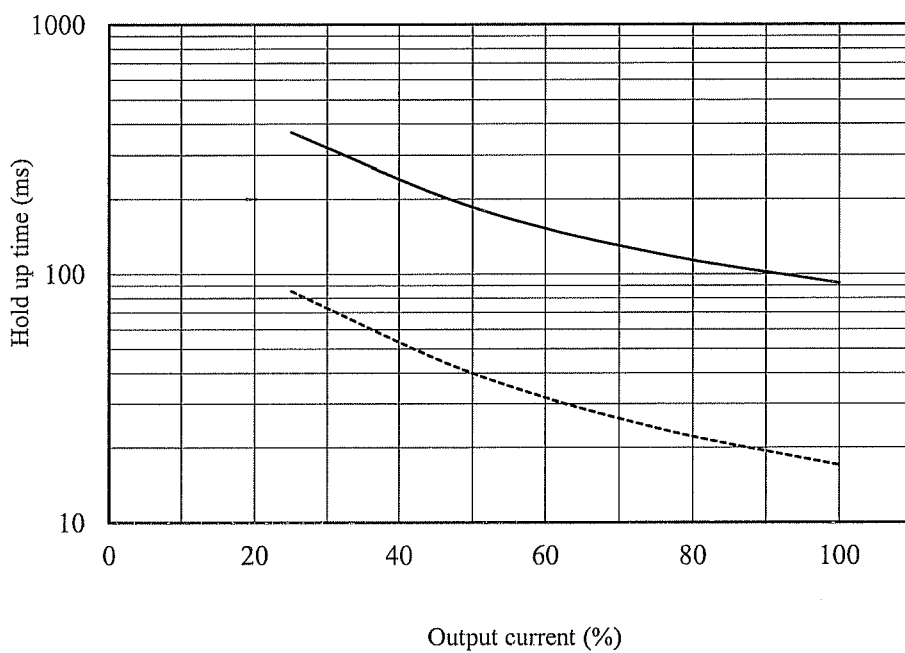
Hold up time characteristics

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

Model:CUT75-522



Model:CUT75-5FF



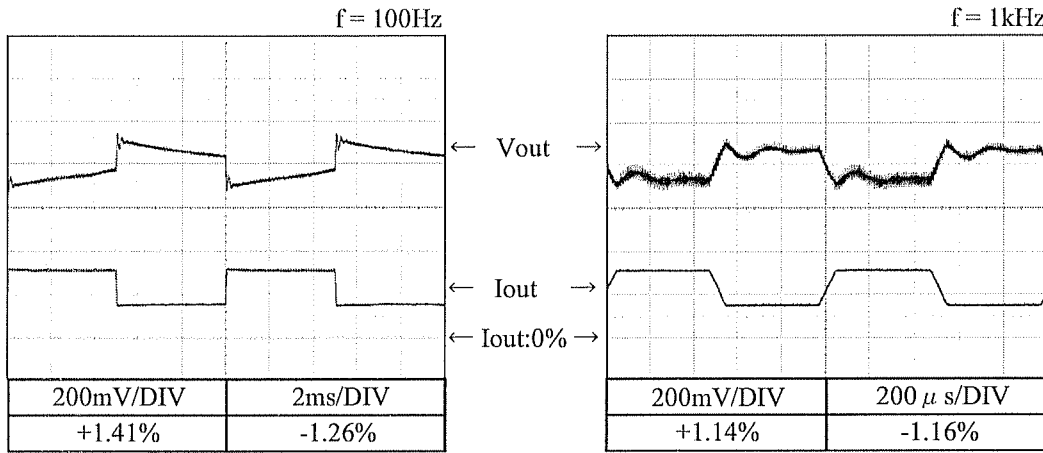
2.7 過渡応答（負荷急変）特性

Dynamic load response characteristics  
Model: CUT75-522

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

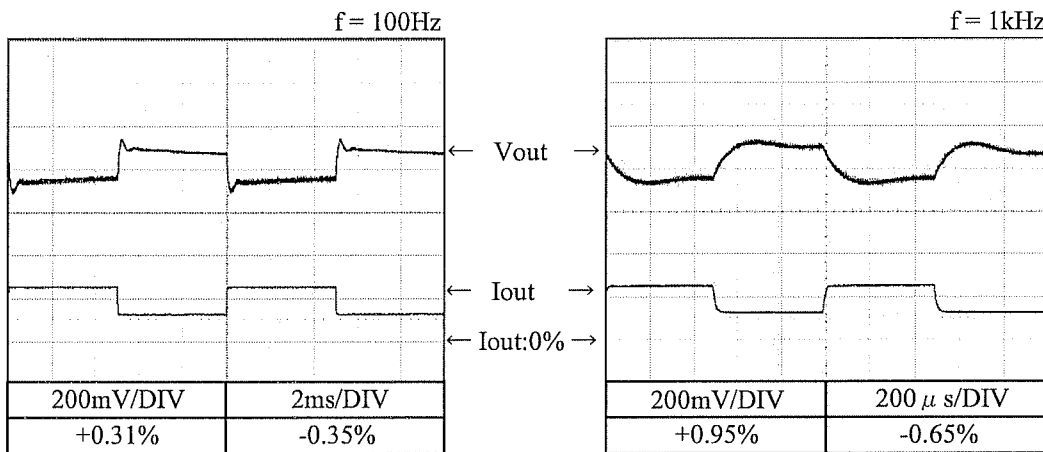
5V

Iout : 5V:50%↔100%  
±12V:100%



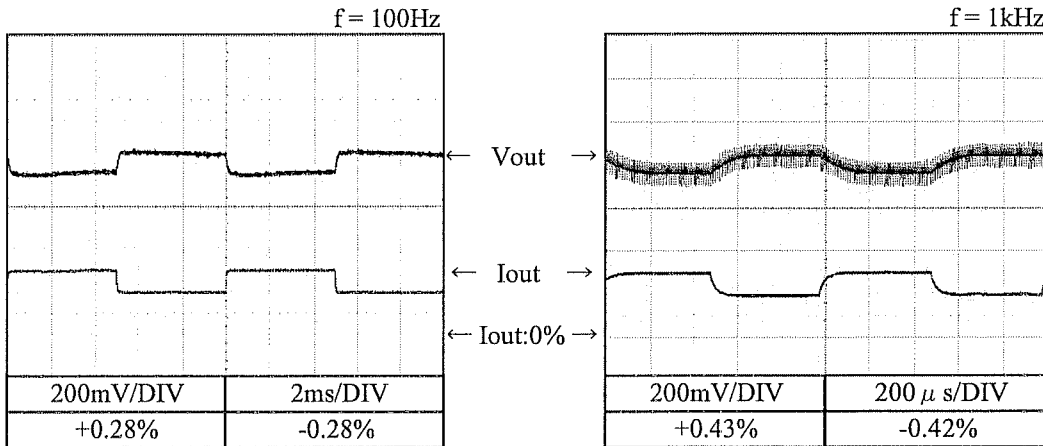
+12V

Iout : 12V:50%↔100%  
5V,-12V:100%



-12V

Iout : -12V:50%↔100%  
5V,+12V:100%



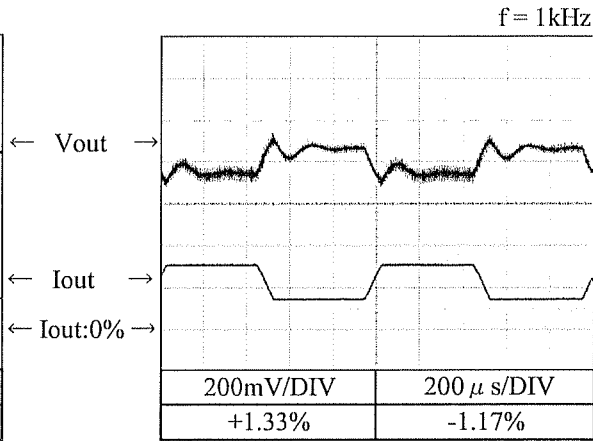
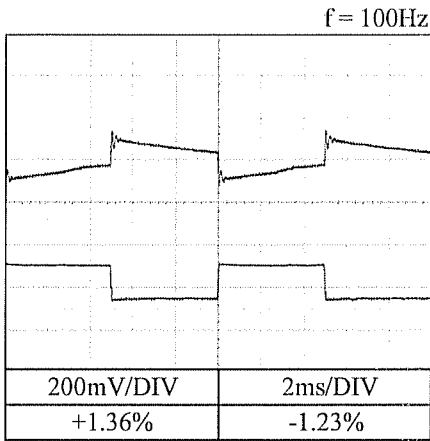
2.7 過渡応答（負荷急変）特性

Dynamic load response characteristics  
Model: CUT75-5FF

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

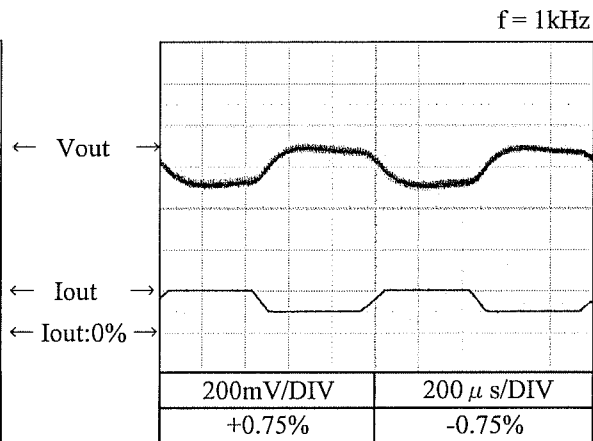
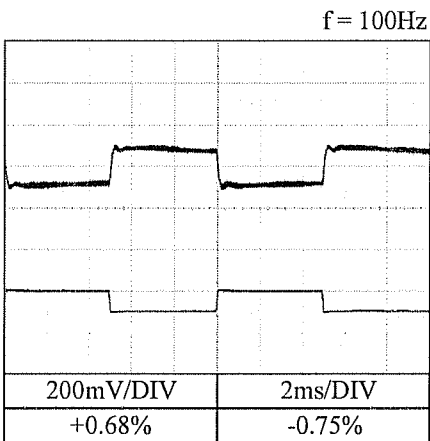
5V

Iout : 5V:50%↔100%  
±15V:100%



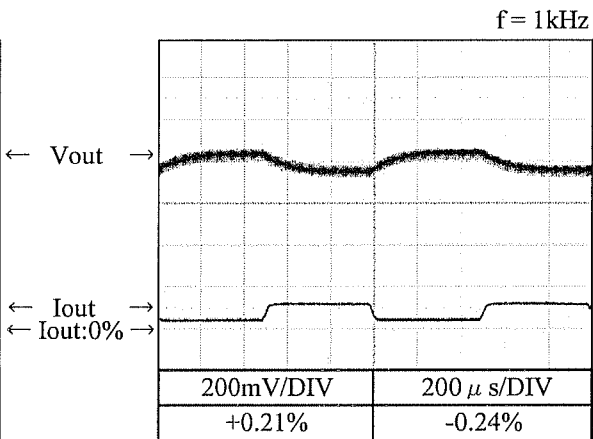
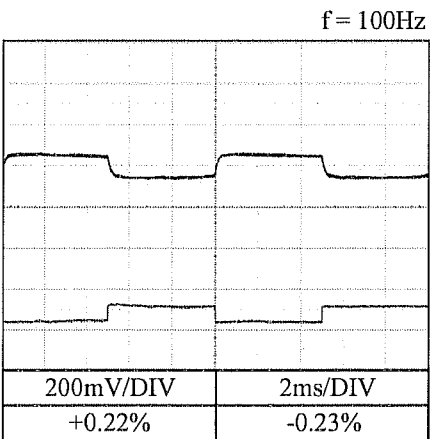
+15V

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:CUT75-522

Conditions Vin : 100 VAC

Iout : 100 %

Ta : 25 °C

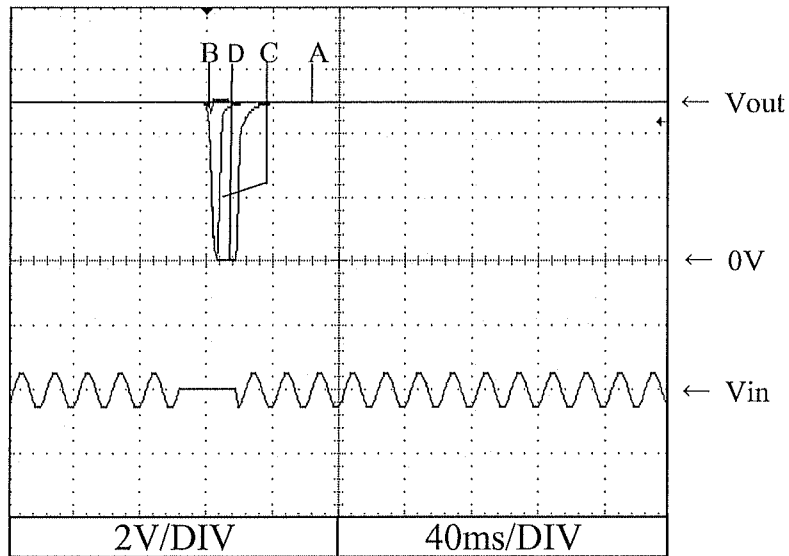
CH1:5V

A = 14ms

B = 17ms

C = 24ms

D = 34ms



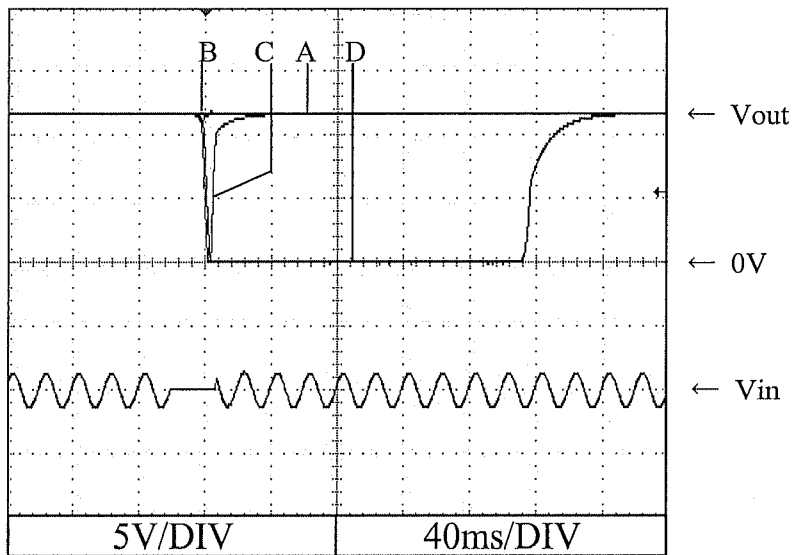
CH2:+12V

A = 14ms

B = 18ms

C = 23ms

D = 27ms



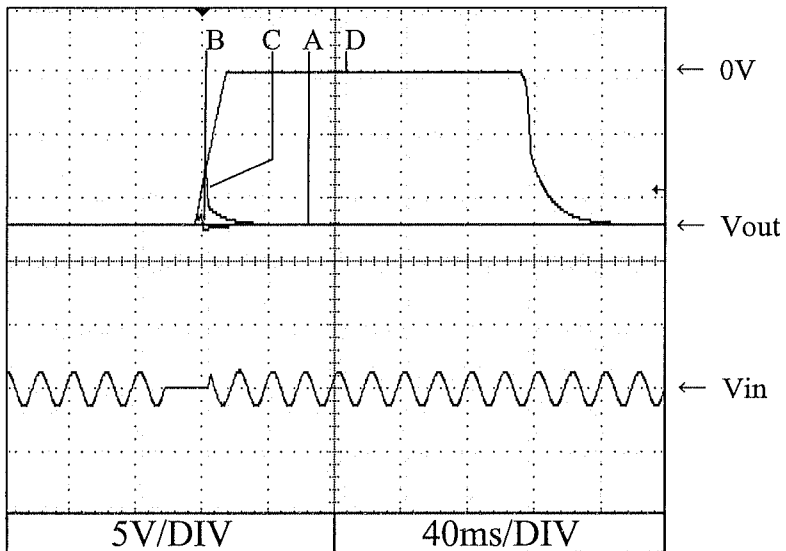
CH3: -12V

A = 17ms

B = 19ms

C = 23ms

D = 26ms



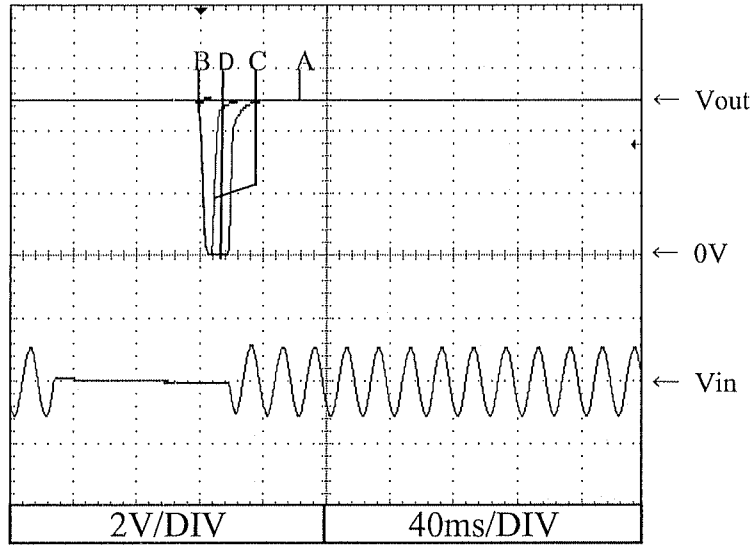
2.8 入力電圧瞬停特性

Response to brown out characteristics  
Model: CUT75-522

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

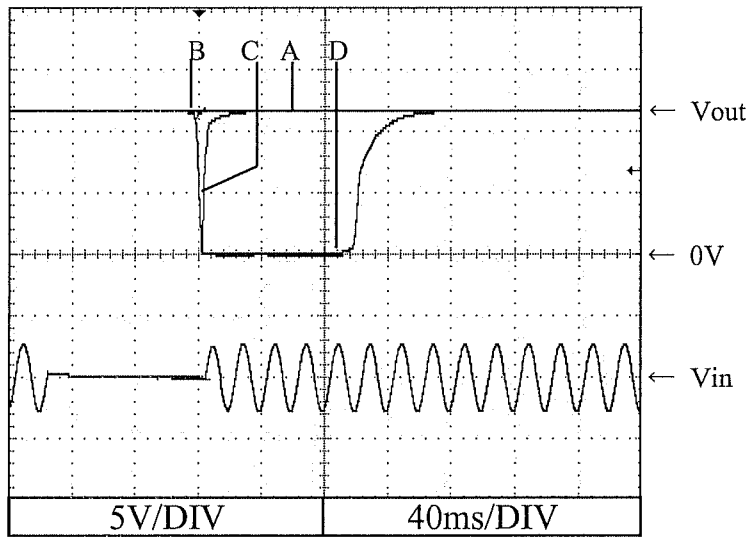
CH1: 5V

A = 85ms  
B = 90ms  
C = 98ms  
D = 110ms



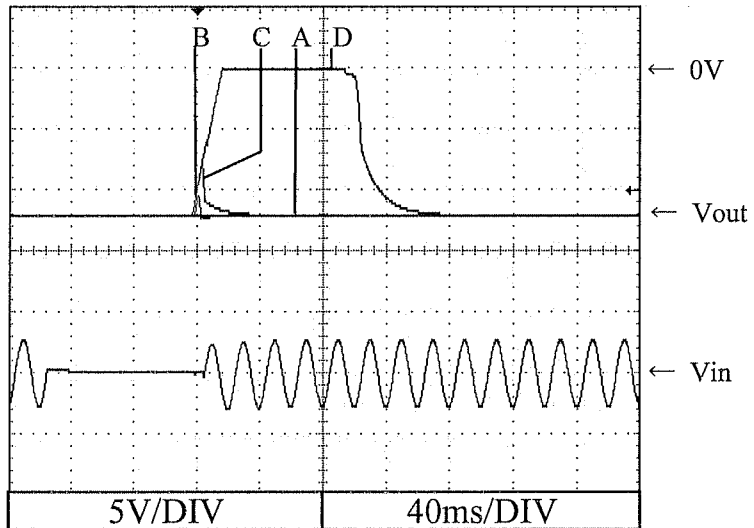
CH2: +12V

A = 88ms  
B = 93ms  
C = 97ms  
D = 103ms



CH3: -12V

A = 88ms  
B = 93ms  
C = 96ms  
D = 99ms



2.8 入力電圧瞬停特性

Response to brown out characteristics

Model: CUT75-5FF

Conditions  $V_{in}$  : 100 VAC

$I_{out}$  : 100 %

$T_a$  : 25 °C

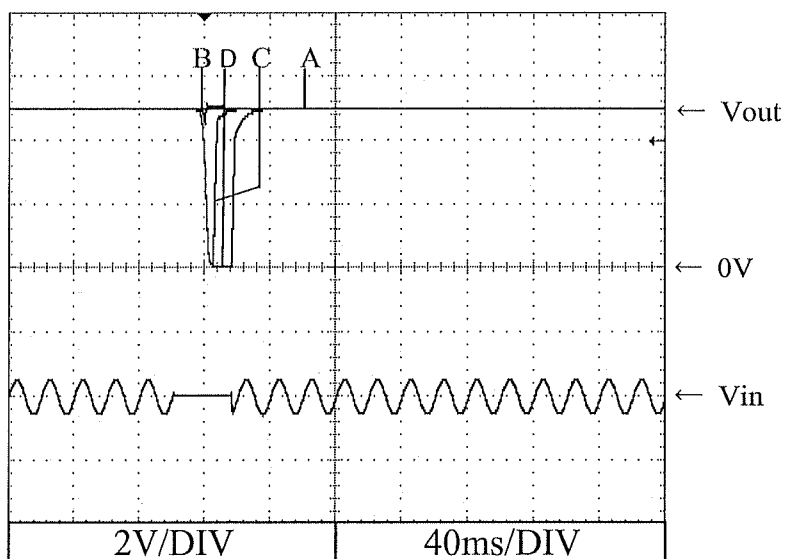
CH1: 5V

A = 12ms

B = 17ms

C = 24ms

D = 35ms



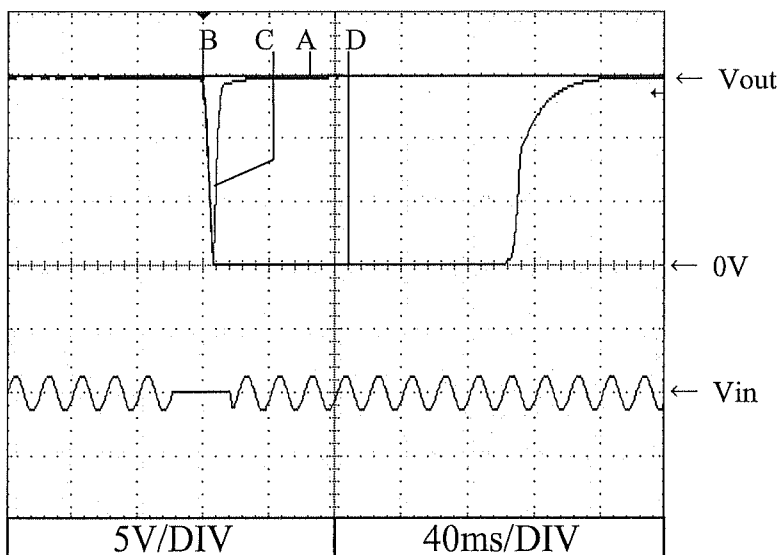
CH2: +15V

A = 12ms

B = 17ms

C = 24ms

D = 30ms



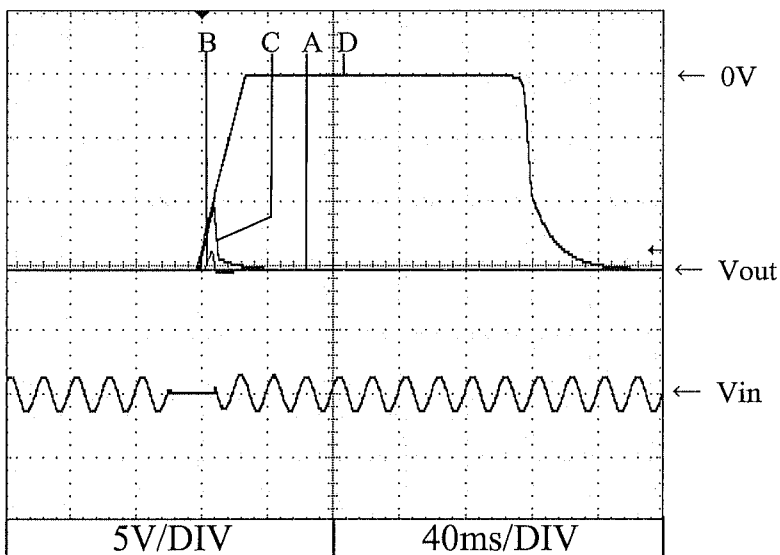
CH3: -15V

A = 16ms

B = 19ms

C = 25ms

D = 29ms



2.8 入力電圧瞬停特性

Response to brown out characteristics

Model:CUT75-5FF

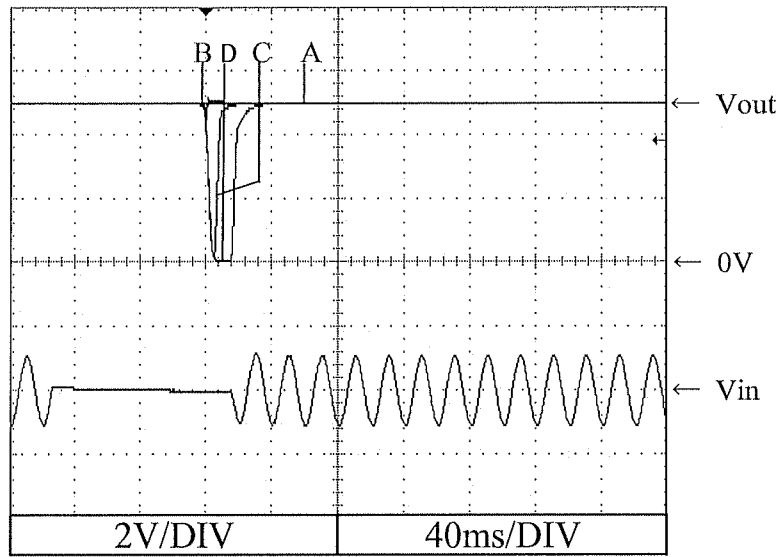
Conditions Vin : 200 VAC

Iout : 100 %

Ta : 25 °C

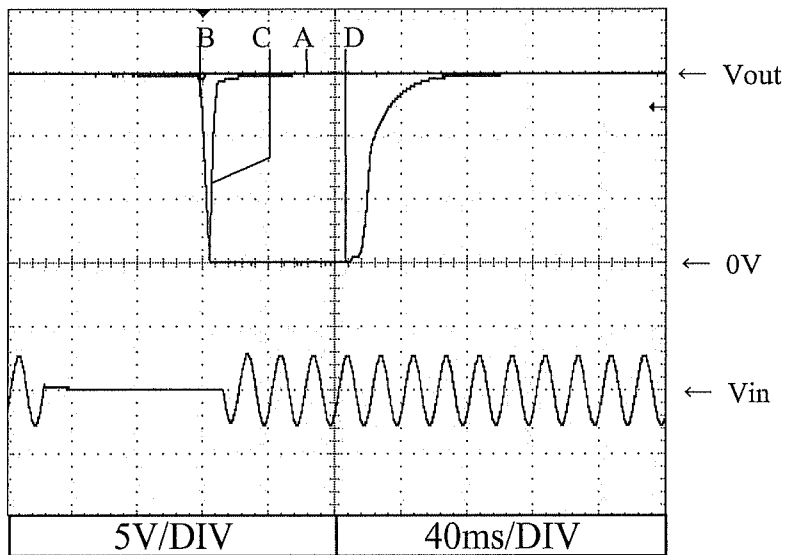
CH1:5V

- A = 85ms
- B = 93ms
- C = 100ms
- D = 110ms



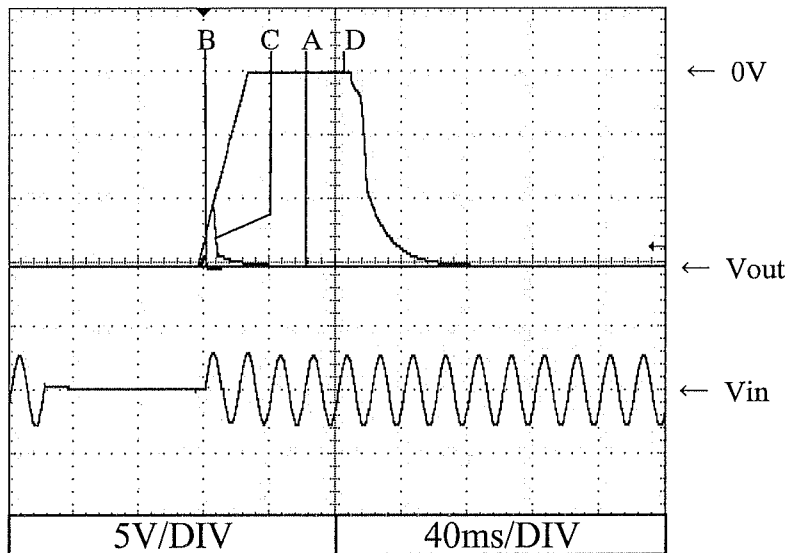
CH2:+15V

- A = 82ms
- B = 95ms
- C = 101ms
- D = 107ms



CH3: -15V

- A = 88ms
- B = 95ms
- C = 101ms
- D = 105ms

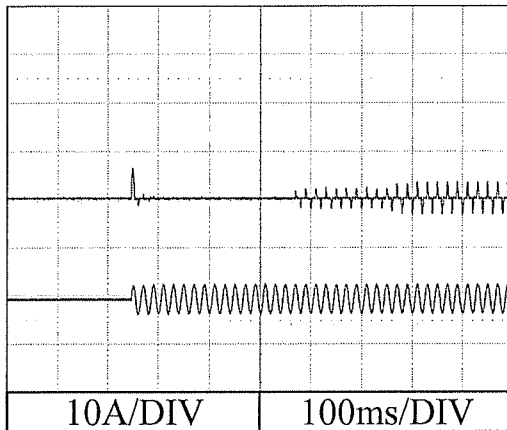




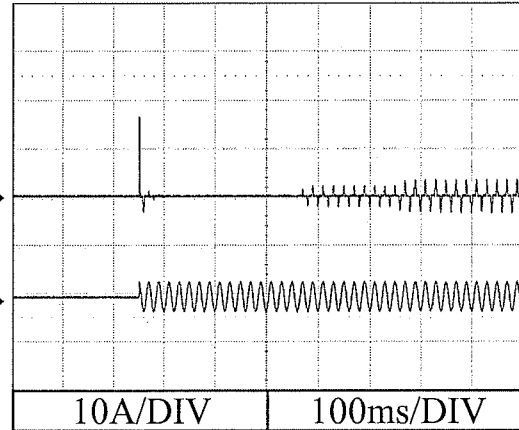
2.9 入力サージ電流（突入電流）波形  
Inrush current waveform

Conditions  $V_{in}$  : 100 VAC  
 $I_{out}$  : 100 %  
 $T_a$  : 25 °C

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

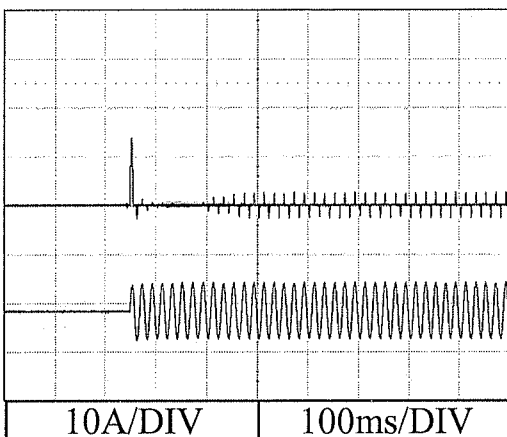


Switch on phase angle of input AC voltage  
 $\phi = 90^\circ$

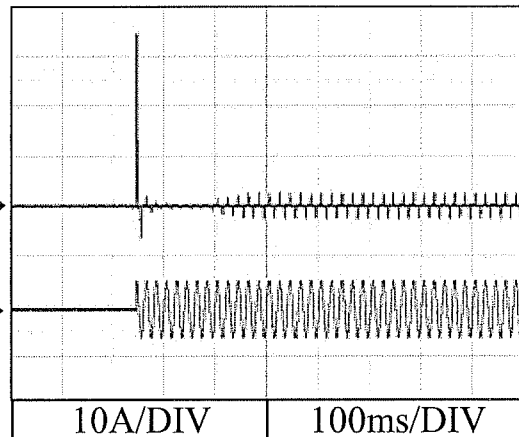


Conditions  $V_{in}$  : 200 VAC  
 $I_{out}$  : 100 %  
 $T_a$  : 25 °C

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



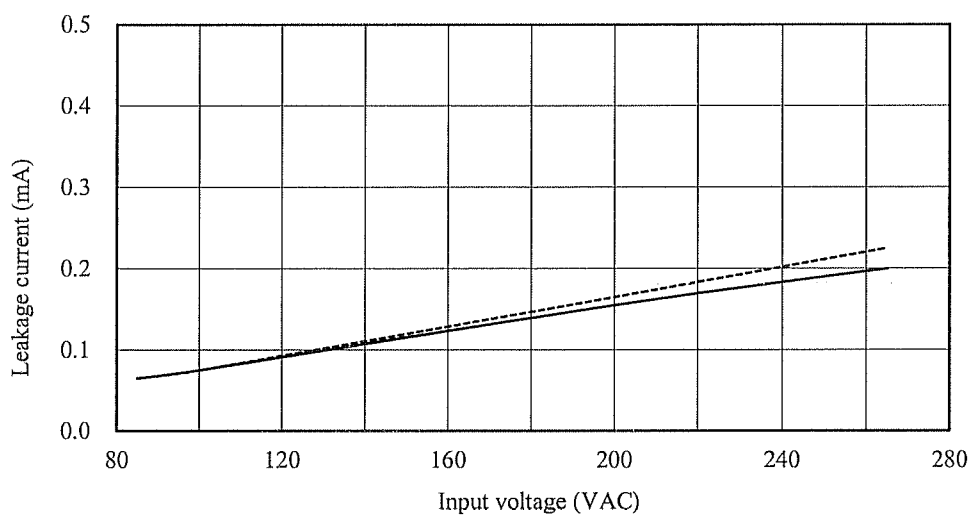
Switch on phase angle of input AC voltage  
 $\phi = 90^\circ$



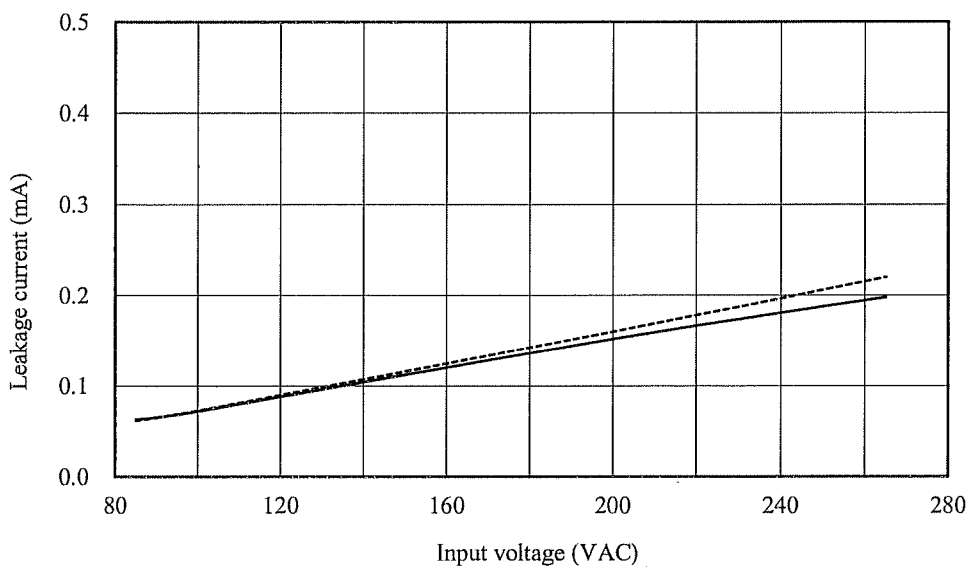
2.10 リーク電流特性  
Leakage current characteristics

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

L



N



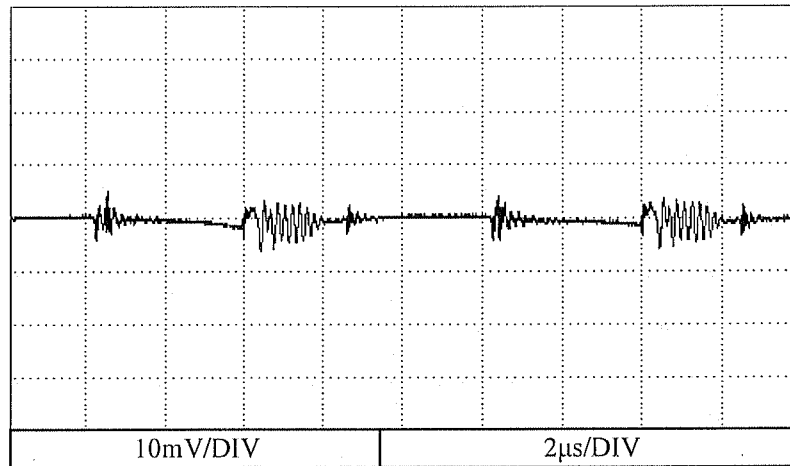
2.11 出力リップル、ノイズ波形  
Output ripple and noise waveform  
Model: CUT75-522

Conditions

Vin : 100VAC  
Ta : 25°C

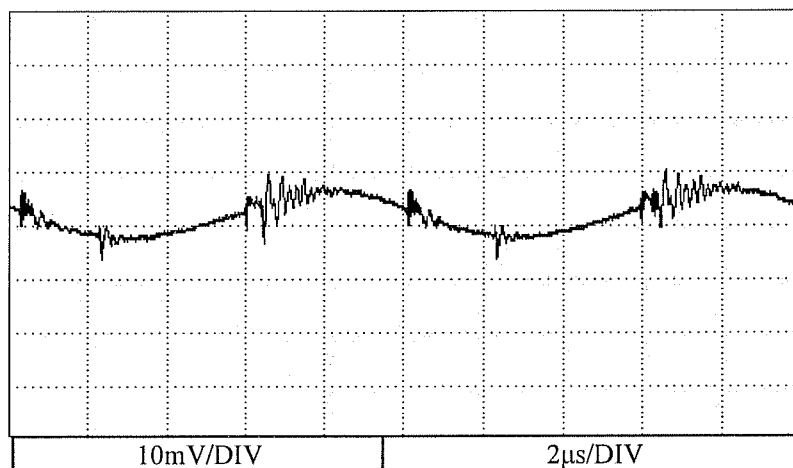
CH1:5V

Iout : 100%



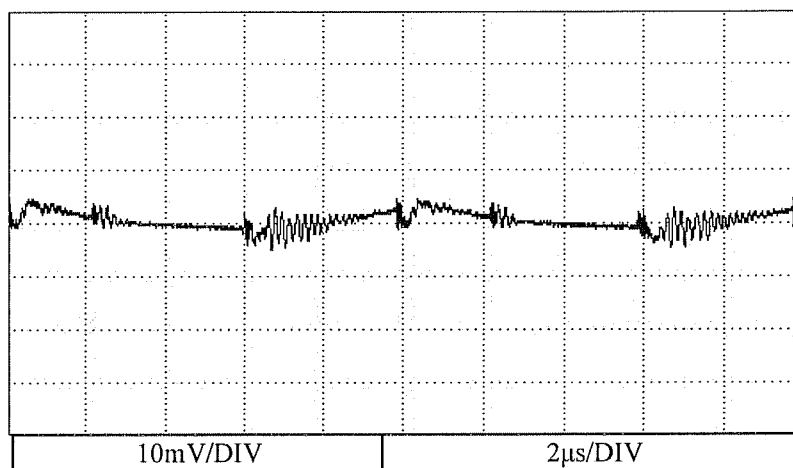
CH2:+12V

Iout : 100%



CH3:-12V

Iout : 100%



## 2.11 出力リップル、ノイズ波形

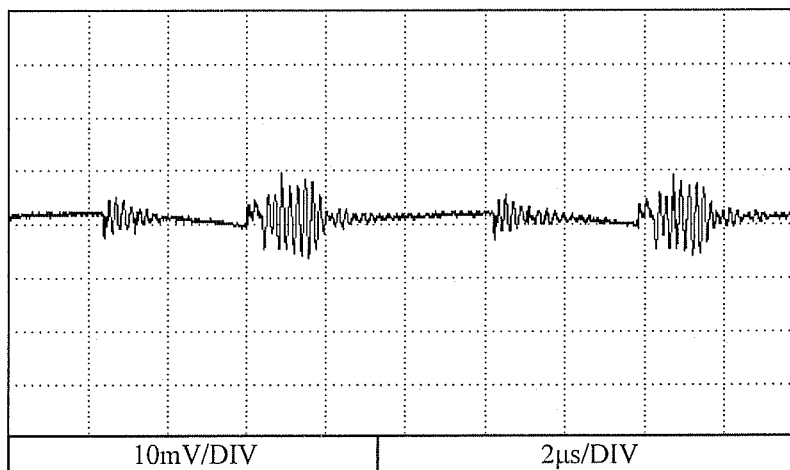
Output ripple and noise waveform  
Model: CUT75-5FF

Conditions

Vin : 100VAC  
Ta : 25°C

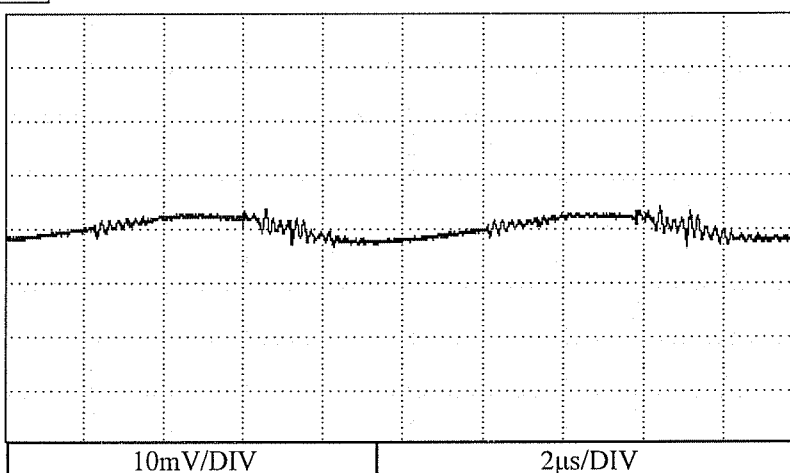
CH1:5V

Iout : 100%



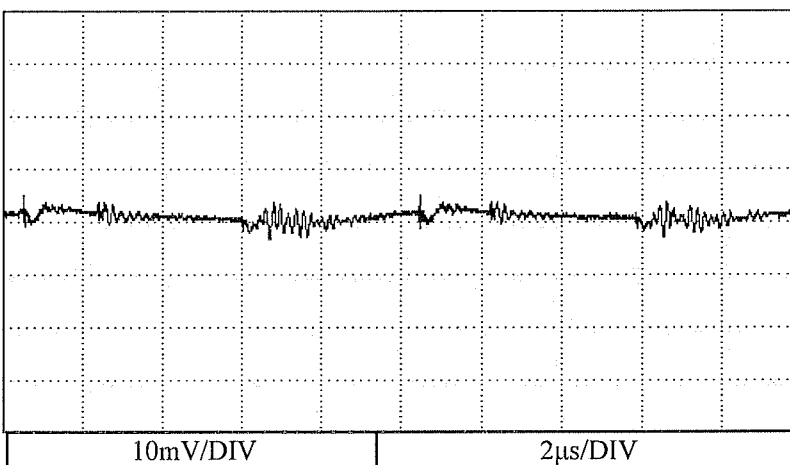
CH2:+15V

Iout : 100%



CH3:-15V

Iout : 100%



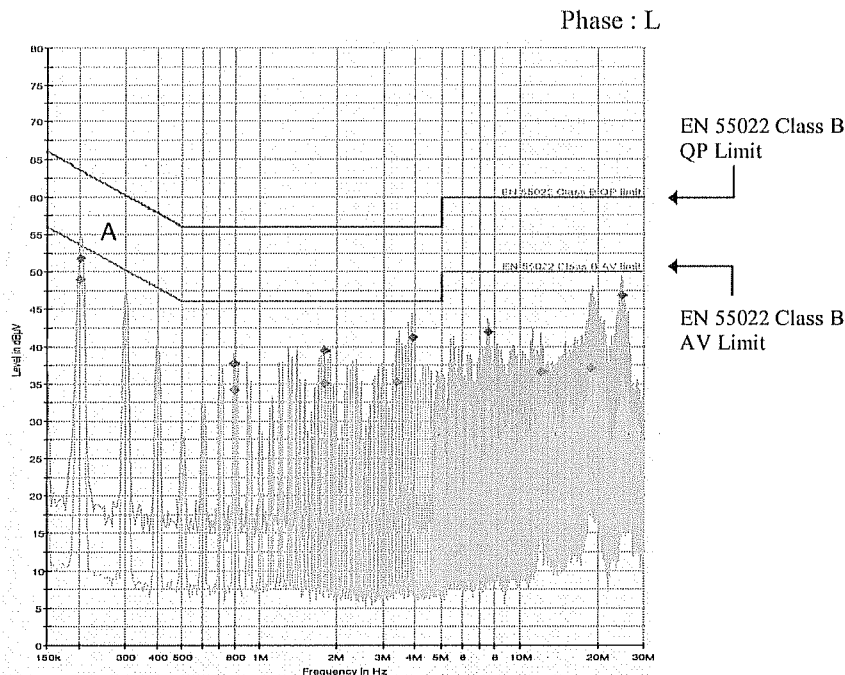
2.12 EMI 特性

Electro-Magnetic Interference characteristics  
Model:CUT75-522

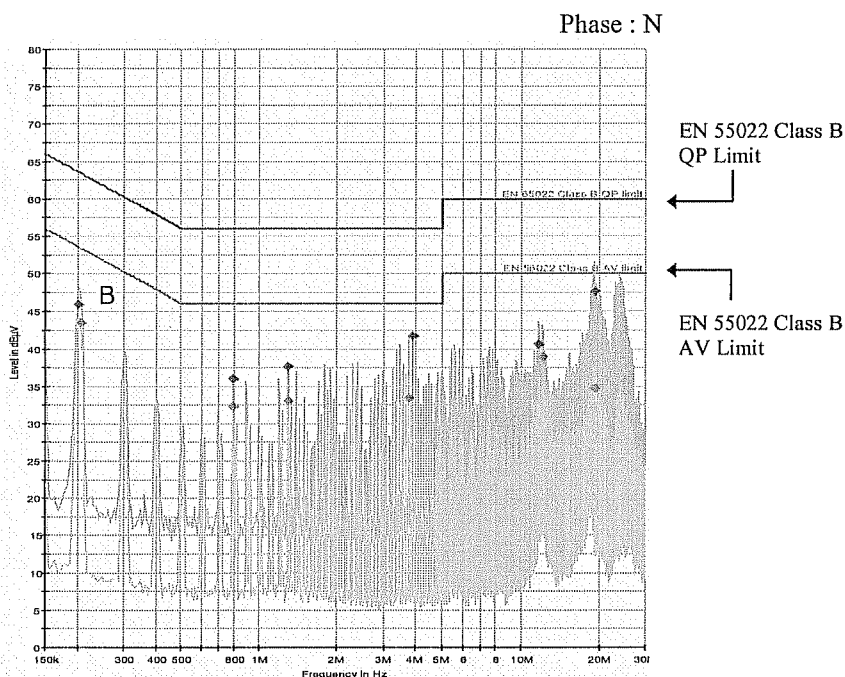
Conditions Vin : 230 VAC  
Iout : 100 %  
Ta : 25 °C

雑音端子電圧  
Conducted Emission

Ref. Data	Point A (199.5kHz)	
	Limit (dBuV)	Measure (dBuV)
QP	63.6	51.8
AV	53.6	49.0



Ref. Data	Point B (199.5kHz)	
	Limit (dBuV)	Measure (dBuV)
QP	63.6	45.9
AV	53.6	43.6



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.

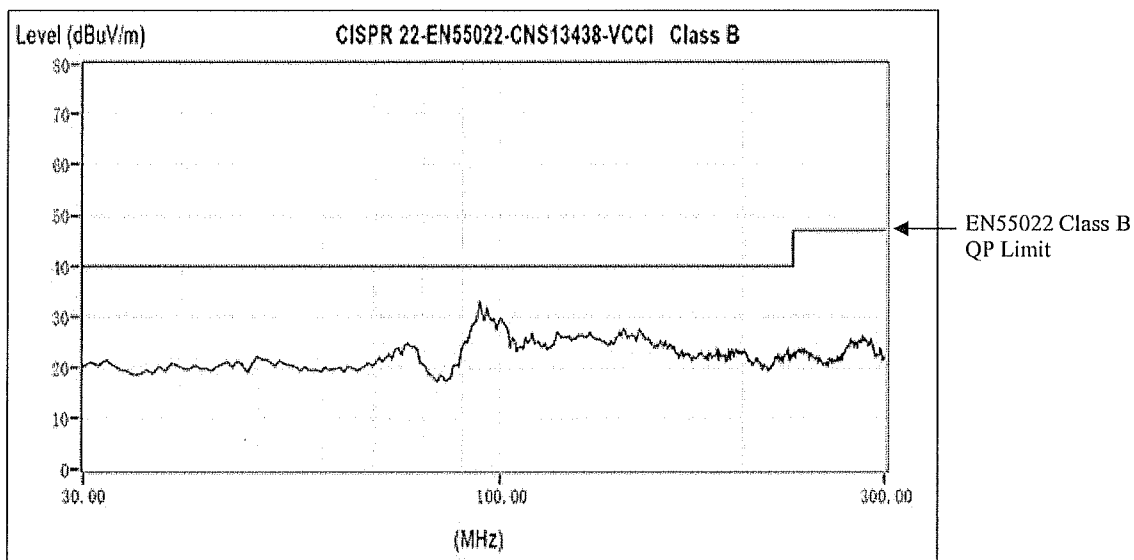
2.12 EMI 特性

Electro-Magnetic Interference characteristics  
 Model: CUT75-522

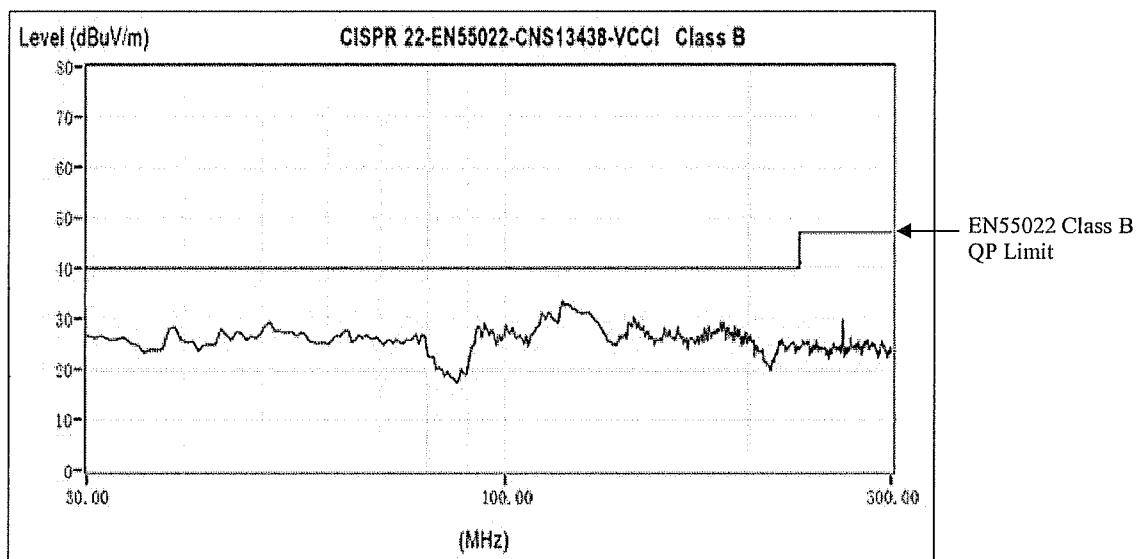
Conditions Vin: 230VAC  
 Io: 100%  
 Ta: 25°C

雑音電界強度  
 Radiated Emission

Polarity: Horizontal



Polarity: Vertical



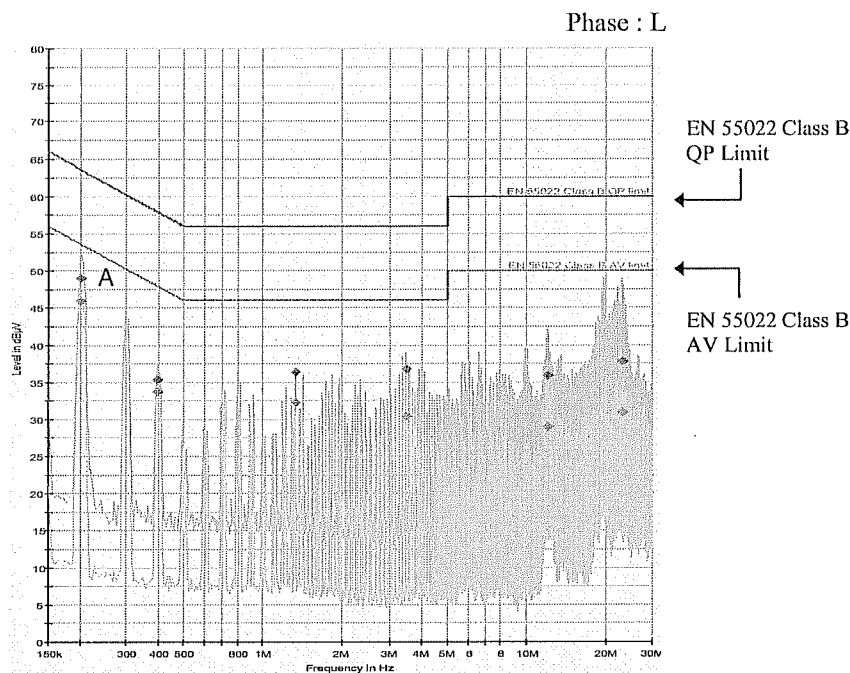
2.12 EMI 特性

Electro-Magnetic Interference characteristics  
Model: CUT75-5FF

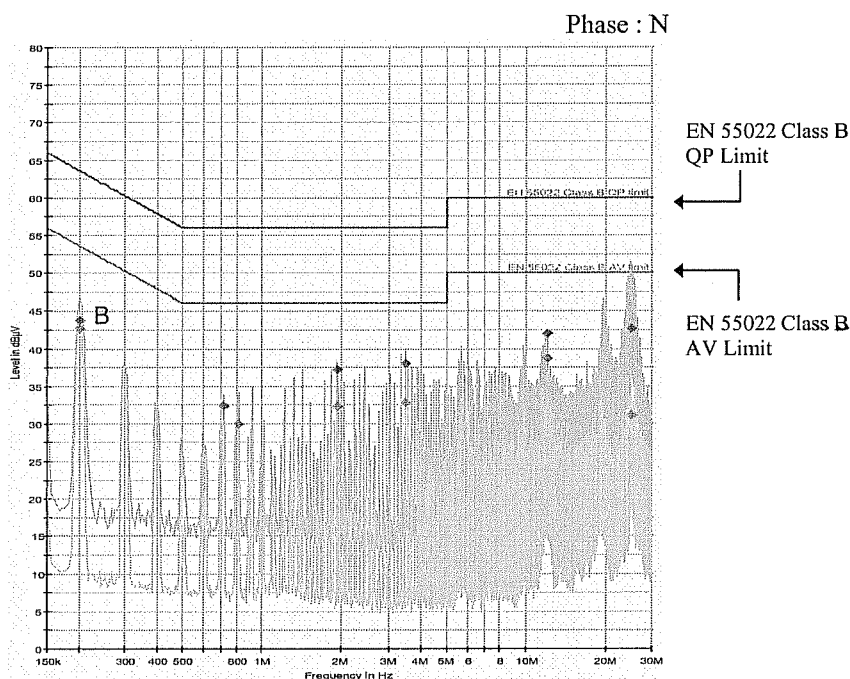
Conditions Vin : 230 VAC  
Iout : 100 %  
Ta : 25 °C

雑音端子電圧  
Conducted Emission

Point A (199.5kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	63.6	49.0
AV	53.6	45.9



Point B (199.5kHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	63.6	43.8
AV	53.6	42.6



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.

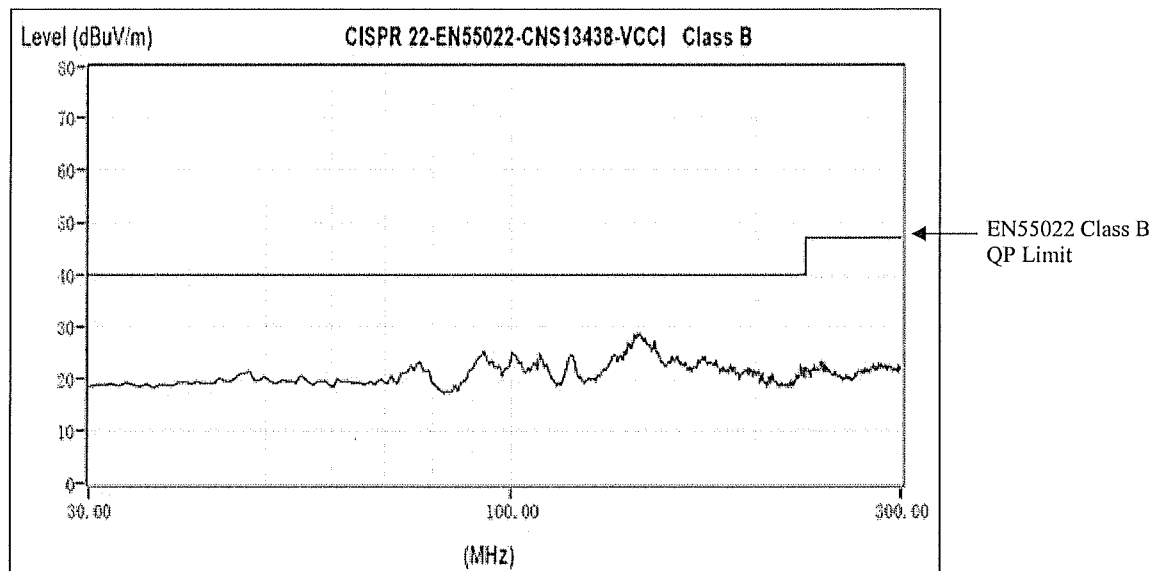
2.12 EMI 特性

Electro-Magnetic Interference characteristics  
 Model: CUT75-5FF

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

雑音電界強度  
 Radiated Emission

Polarity: Horizontal



Polarity: Vertical

