CUT75J

EVALUATION DATA

型式データ

INDEX

2. 特性データ　Characteristics

使用記号　Terminology used

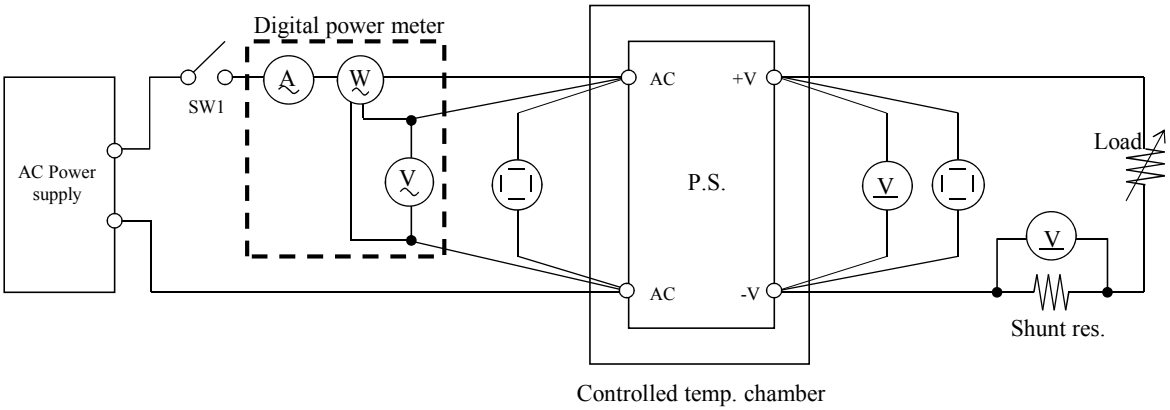
	定義　Definition
Vin	..... 入力電圧　Input voltage
Vout	..... 出力電圧　Output voltage
Iin	..... 入力電流　Input current
Iout	..... 出力電流　Output current
Ta	..... 周囲温度　Ambient temperature
f	..... 周波数　Frequency

1. 測定方法　Evaluation Method

1.1　測定回路　Circuit used for determination

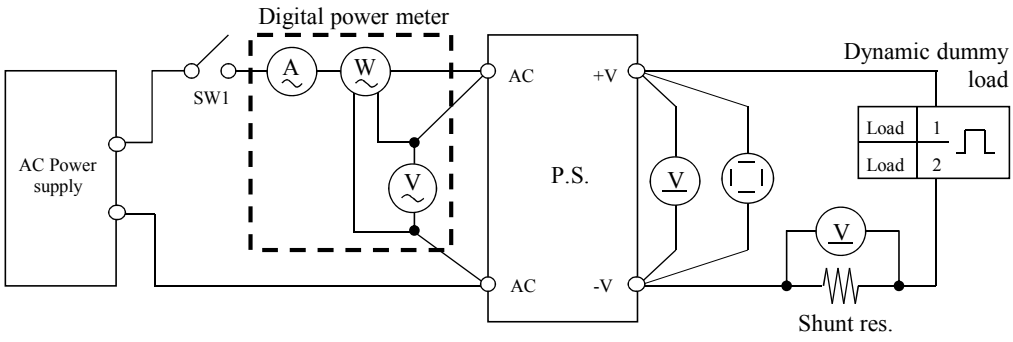
測定回路1 Circuit 1 used for determination

- ・静特性　Steady state data
- ・通電ドリフト特性　Warm up voltage drift characteristics
- ・出力保持時間特性　Hold up time characteristics
- ・出力立ち上がり特性　Output rise characteristics
- ・出力立ち下がり特性　Output fall characteristics
- ・過電流保護特性　Over current protection (OCP) characteristics
- ・過電圧保護特性　Over voltage protection (OVP) characteristics
- ・入力電圧瞬停特性　Response to brown out characteristics

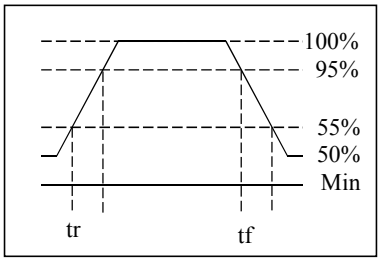


測定回路2 Circuit 2 used for determination

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

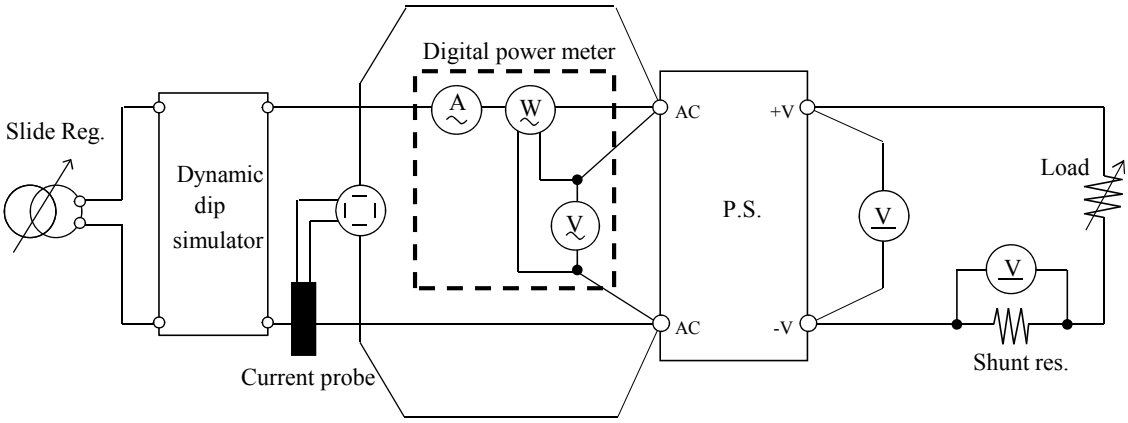


Output current waveform
Iout 50% <==> 100%



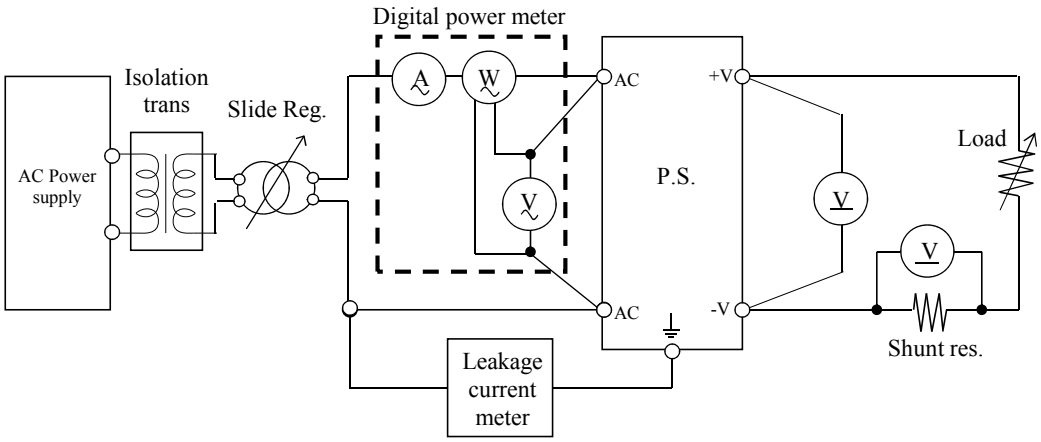
測定回路3 Circuit 3 used for determination

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



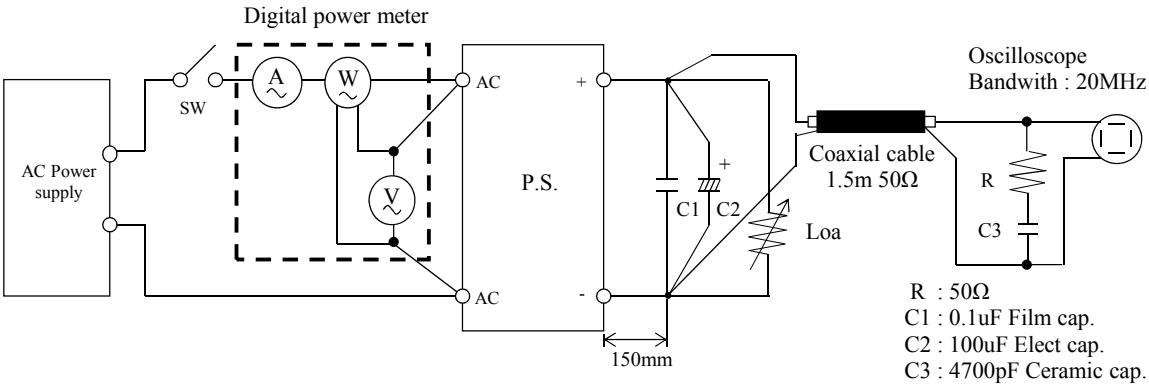
測定回路4 Circuit 4 used for determination

・リーク電流特性　Leakage current characteristics



測定回路5 Circuit 5 used for determination

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

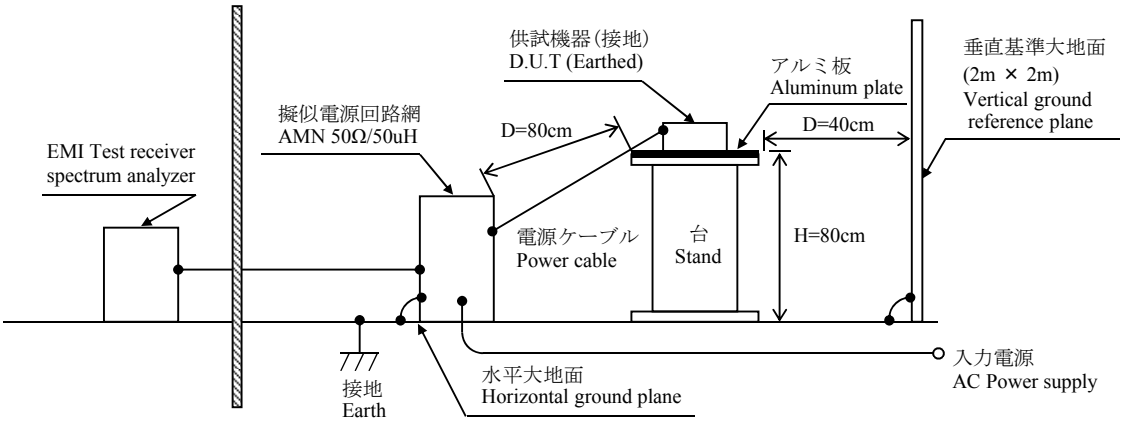


測定構成 Configuration used for determination

・EMI特性　Electro-Magnetic Interference characteristics

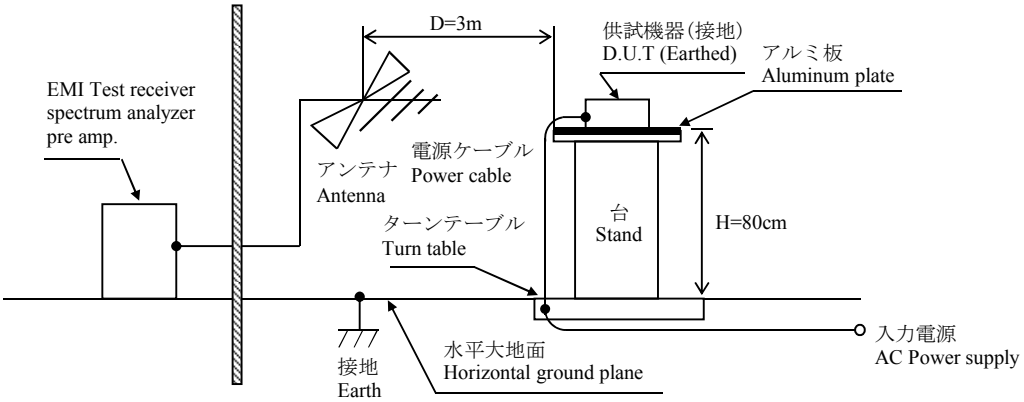
(a) 雑音端子電圧 (帰還ノイズ)

Conducted Emission



(b) 雑音電界強度 (放射ノイズ)

Radiated Emission



1.2 使用測定機器　　List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	TEKTRONIX	TDS7054
2	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA	DLM2054
3	DIGITAL MULTIMETER	FLUKE	45
4	DIGITAL POWER METER	YOKOGAWA	WT210
5	CURRENT PROBE	TEKTRONIX	TCP312
6	CURRENT PROBE	YOKOGAWA	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 / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESCI-03
13	AMN	SCHWARZBECK	NNLK8121
14	ANTENNA	SCHWARZBECK	VULB9168

1.3 評価負荷条件　　Load conditions

入力電圧が100VAC以下の場合、下記のとおり出力ディレーティングが必要です。
Output derating is needed when input voltage is less than 100VAC.
Load (%)は代表出力電流の割合です。
Load (%) is percent of typical output current.

		CUT75J-522			CUT75J-5FF		
Vin	Load	+5V	+12V	-12V	+5V	+15V	-15V
85VAC	60%	4.8A	1.5A	0.3A	4.8A	1.2A	0.24A
100 - 265VAC	100%	8.0A	2.5A	0.5A	8.0A	2.0A	0.4A

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 : CUT75J-522

CH1:　+5V　1. Regulation - line and load　　Condition　Ta :　25 ℃

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 regulation	5mV	5mV	4mV	4mV		
	0.100%	0.100%	0.080%	0.080%		

2. Temperature drift　　Conditions　Vin : 100 VAC　Iout : 100 %

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

CH2:　+12V　1. Regulation - line and load　　Condition　Ta :　25 ℃

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 regulation	309mV	309mV	307mV	305mV		
	2.575%	2.575%	2.558%	2.542%		

2. Temperature drift　　Conditions　Vin : 100 VAC　Iout : 100 %

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

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

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 regulation	130mV	131mV	170mV	171mV		
	1.083%	1.092%	1.417%	1.425%		

2. Temperature drift　　Conditions　Vin : 100 VAC　Iout : 100 %

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

3. Start up voltage and Drop out voltage　　Conditions　Ta :　25 ℃　Iout : 100 %

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

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 : CUT75J-5FF

CH1:　+5V　1. Regulation - line and load　　Condition　Ta :　25 ℃

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 regulation	4mV	3mV	3mV	2mV		
	0.080%	0.060%	0.060%	0.040%		

2. Temperature drift　　Conditions　Vin : 100 VAC　Iout : 100 %

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

CH2:　+15V　1. Regulation - line and load　　Condition　Ta :　25 ℃

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 regulation	347mV	347mV	369mV	370mV		
	2.313%	2.313%	2.460%	2.467%		

2. Temperature drift　　Conditions　Vin : 100 VAC　Iout : 100 %

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

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

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 regulation	140mV	130mV	151mV	161mV		
	0.933%	0.867%	1.007%	1.073%		

2. Temperature drift　　Conditions　Vin : 100 VAC　Iout : 100 %

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

3. Start up voltage and Drop out voltage　　Conditions　Ta :　25 ℃　Iout : 100 %

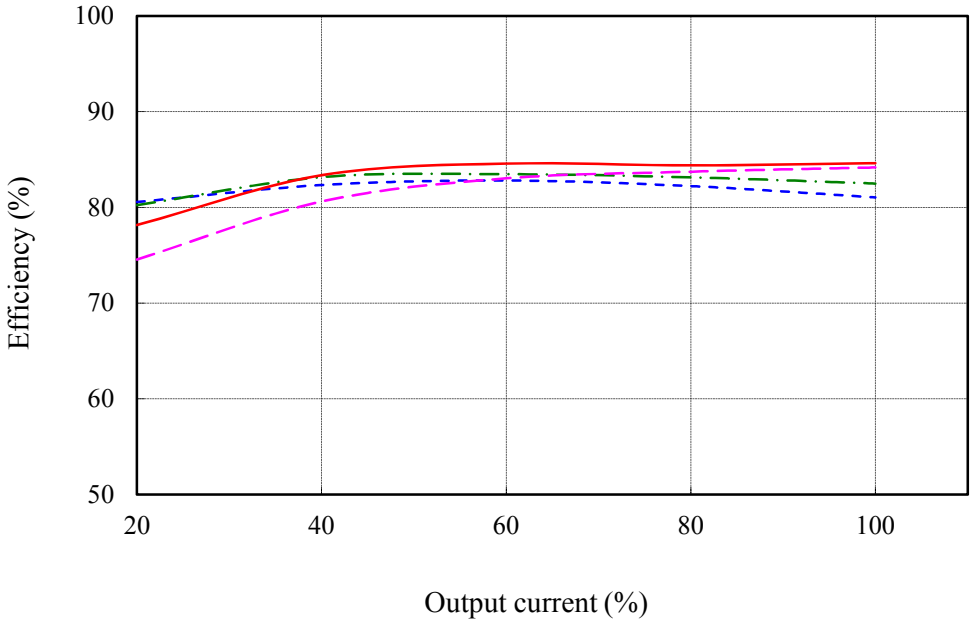
Start up voltage (Vin)	73VAC
Drop out voltage (Vin)	58VAC

(2) 効率対出力電流

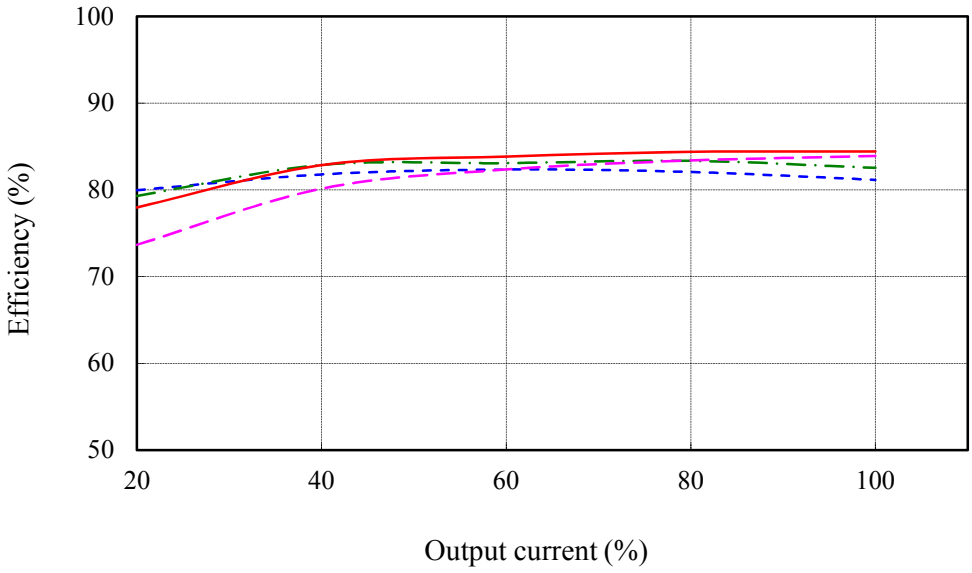
Efficiency vs. Output current

Model : CUT75J-522

Conditions Vin : 85 VAC
: 100 VAC
: 200 VAC
: 265 VAC
Ta : 25 ℃



Model : CUT75J-5FF



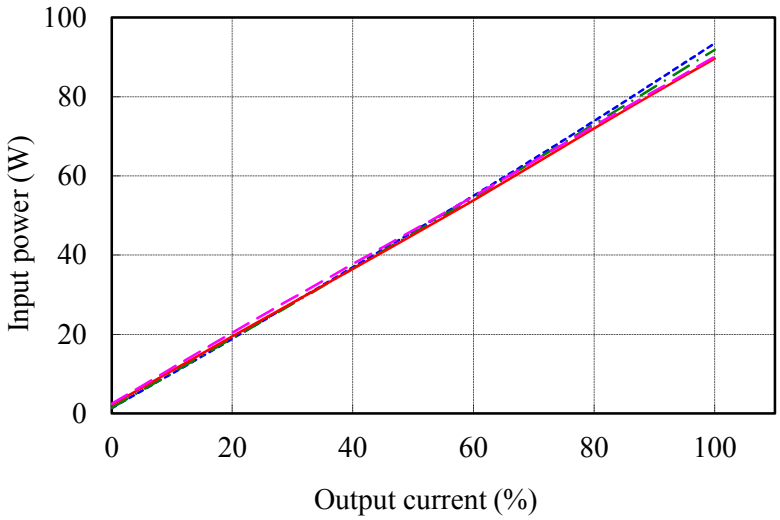
(3) 入力電力対出力電流

Input power vs. Output current

Model : CUT75J-522

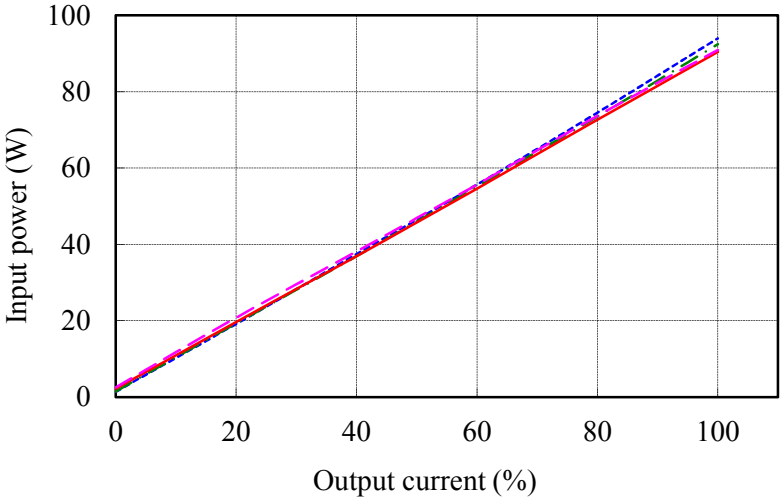
Conditions Vin : 85 VAC
: 100 VAC
: 200 VAC
: 265 VAC
Ta : 25 ℃

Vin	Input power
	Iout : 0%
85VAC	1.35W
100VAC	1.45W
200VAC	2.16W
265VAC	2.45W



Model : CUT75J-5FF

Vin	Input power
	Iout : 0%
85VAC	1.41W
100VAC	1.49W
200VAC	2.20W
265VAC	2.56W



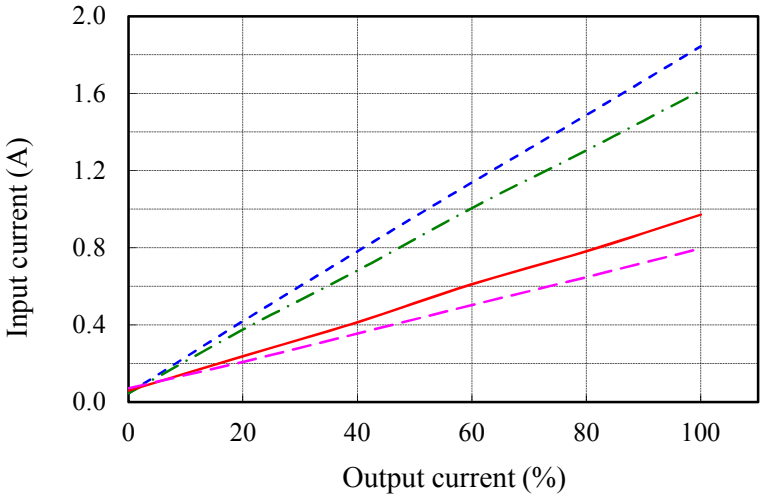
(4) 入力電流対出力電流

Input current vs. Output current

Model : CUT75J-522

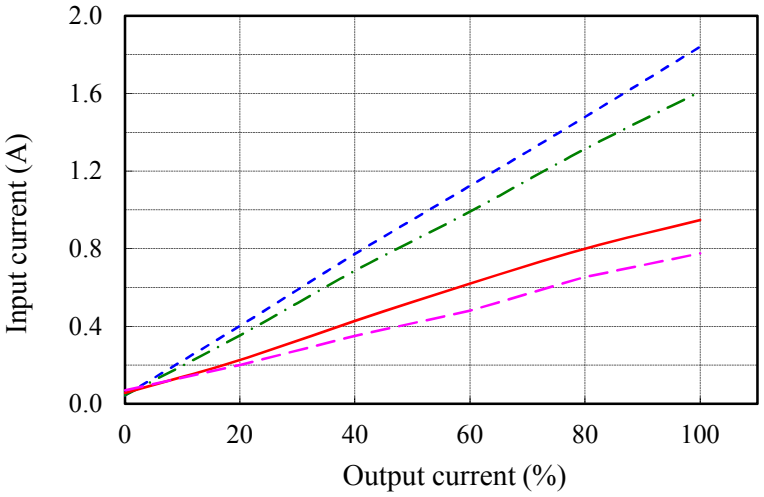
Conditions Vin : 85 VAC
: 100 VAC
: 200 VAC
: 265 VAC
Ta : 25 ℃

Vin	Input power
	Iout : 0%
85VAC	0.045A
100VAC	0.045A
200VAC	0.059A
265VAC	0.071A



Model : CUT75J-5FF

Vin	Input power
	Iout : 0%
85VAC	0.044A
100VAC	0.044A
200VAC	0.057A
265VAC	0.070A



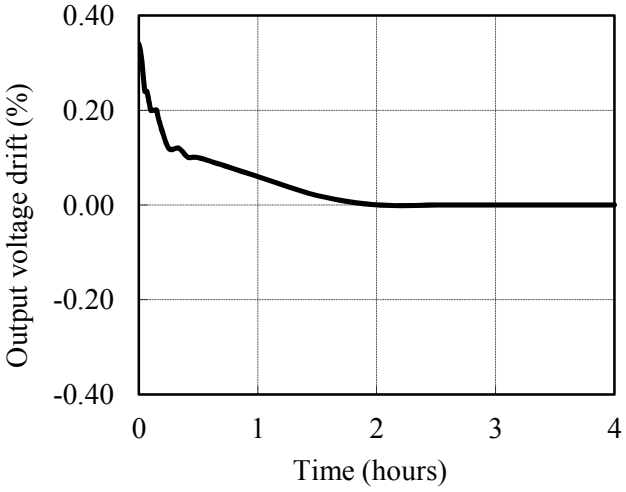
2.2 通電ドリフト特性

Warm up voltage drift characteristics

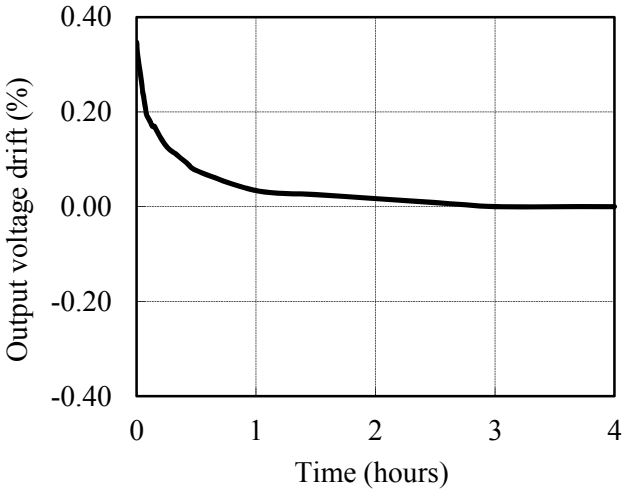
Model : CUT75J-522

Conditions Vin : 100 VAC
Iout : 100 %
Ta : 25 ℃

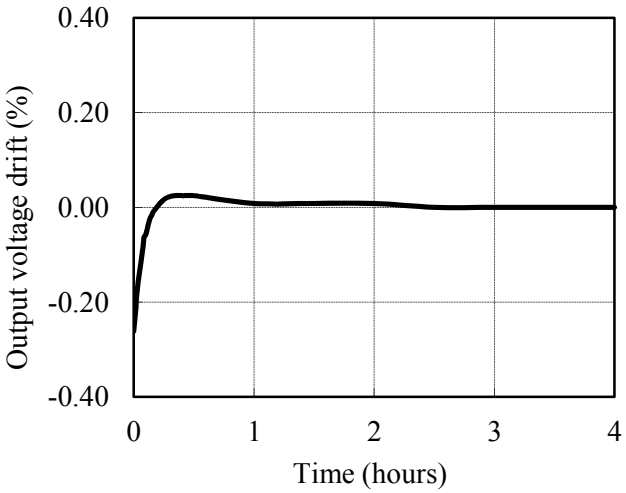
CH1: +5V



CH2: +12V



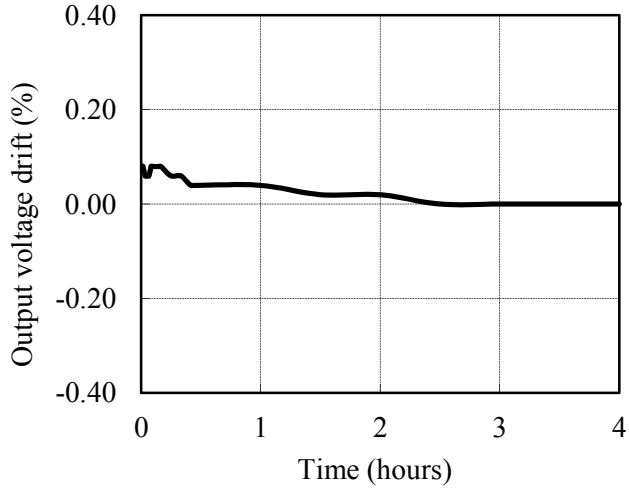
CH3: -12V



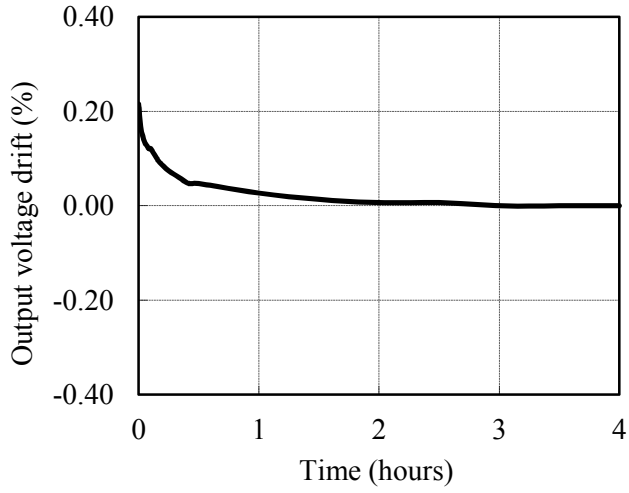
Model : CUT75J-5FF

Conditions Vin : 100 VAC
Iout : 100 %
Ta : 25 ℃

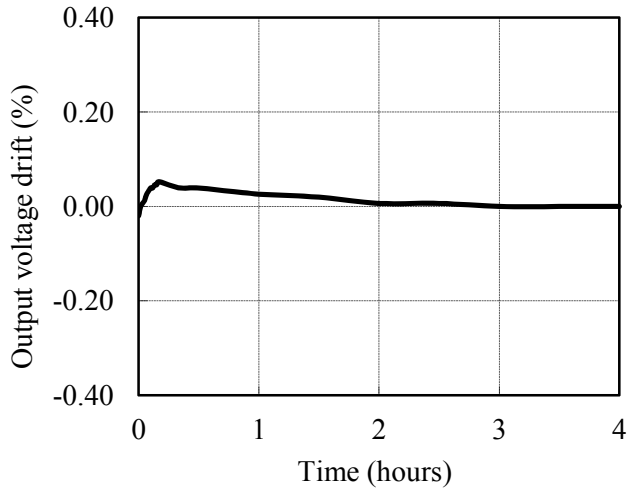
CH1: +5V



CH2: +15V



CH3: -15V

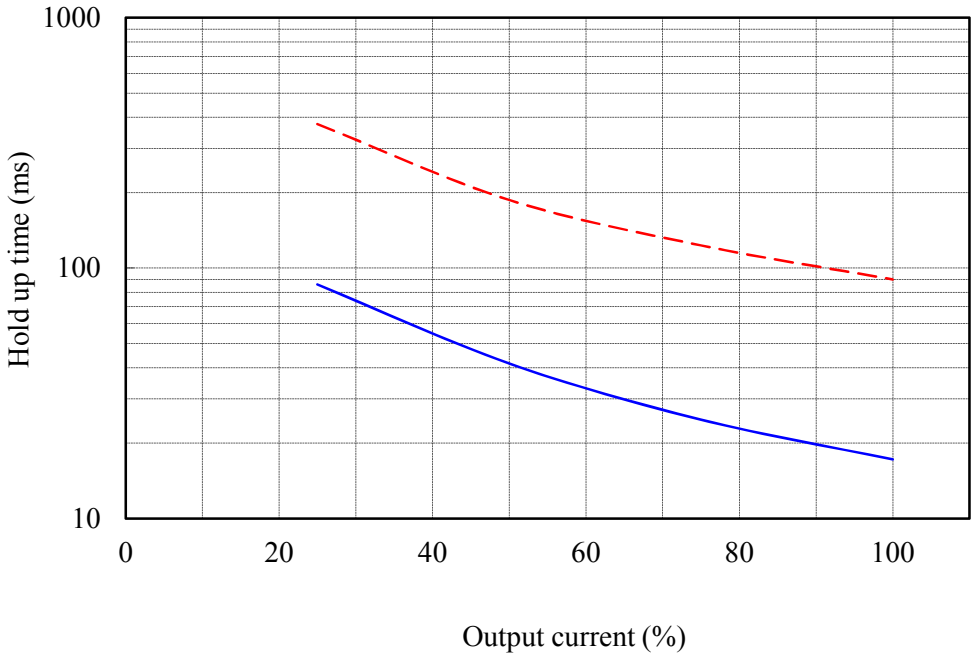


2.3 出力保持時間特性

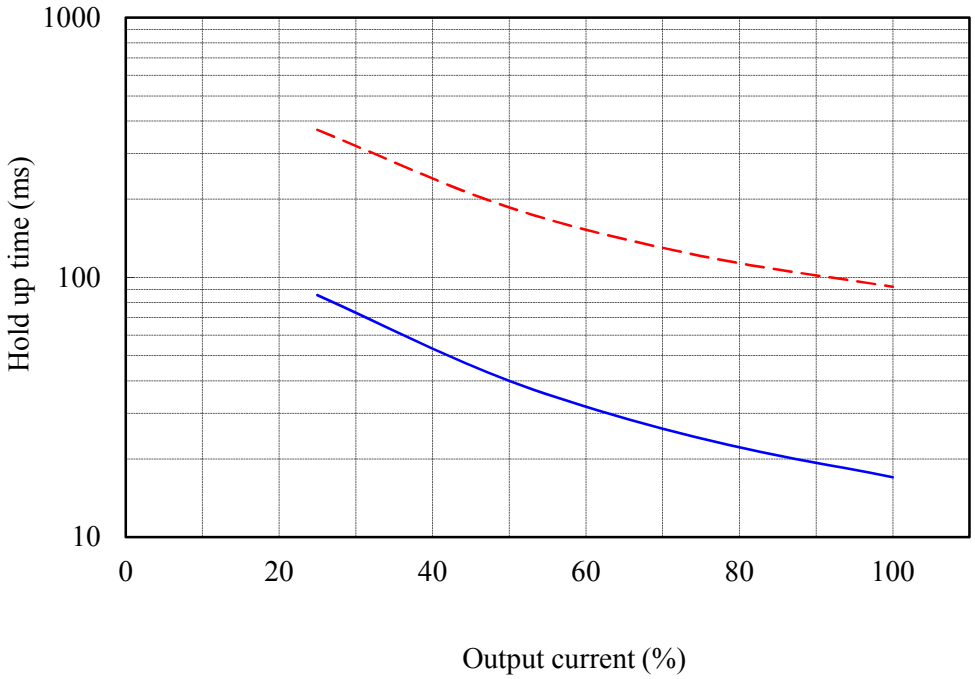
Hold up time characteristics

Model : CUT75J-522

Conditions Vin : 100 VAC
200 VAC
Ta : 25 ℃



Model : CUT75J-5FF



2.4 出力立ち上がり特性

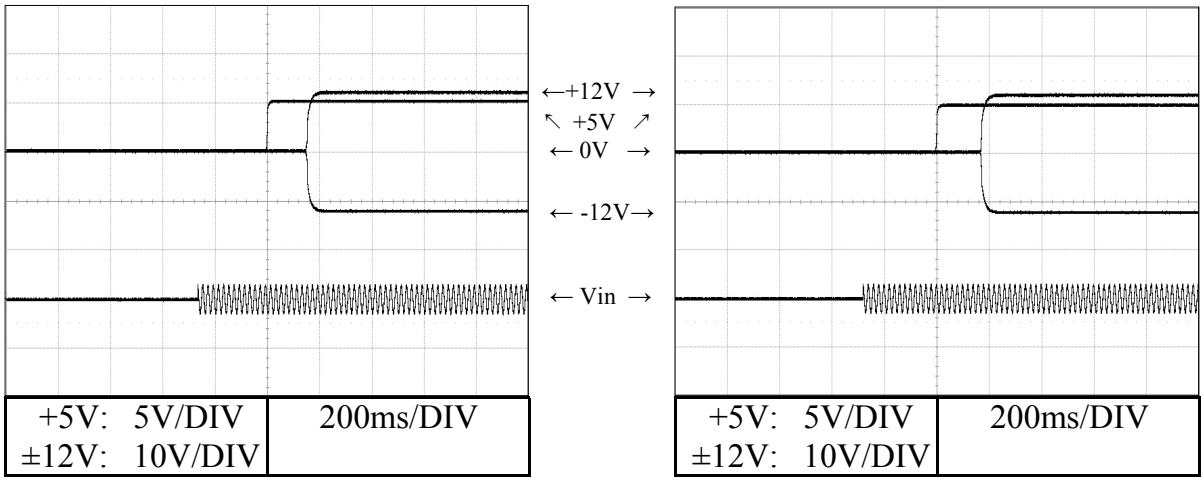
Output rise characteristics

Model : CUT75J-522

Conditions Ta : 25 ℃

Vin : 100 VAC

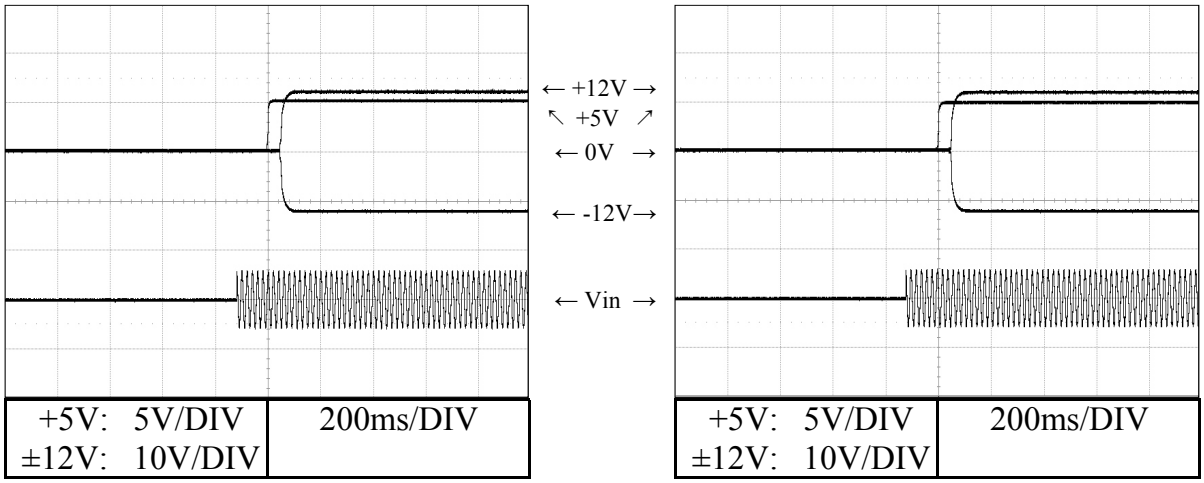
Iout : 0%



Iout : 100%

Vin : 200 VAC

Iout : 0%



Iout : 100%

2.4 出力立ち上がり特性

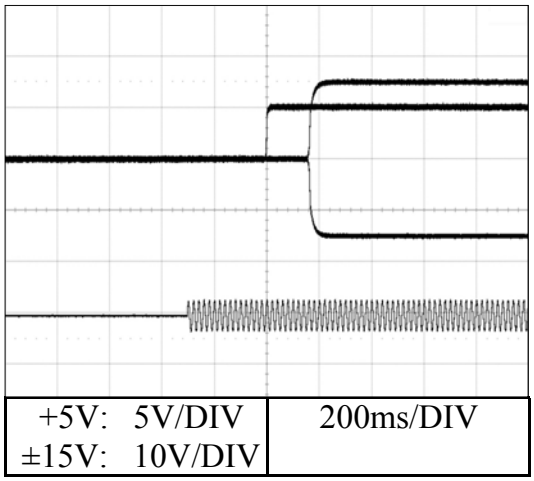
Output rise characteristics

Model : CUT75J-5FF

Conditions Ta : 25 ℃

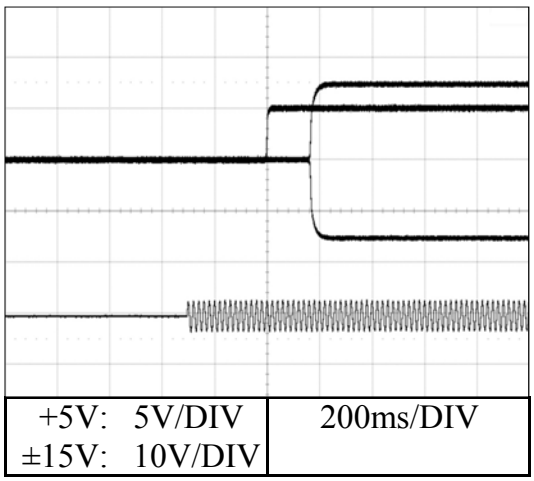
Vin : 100 VAC

Iout : 0%



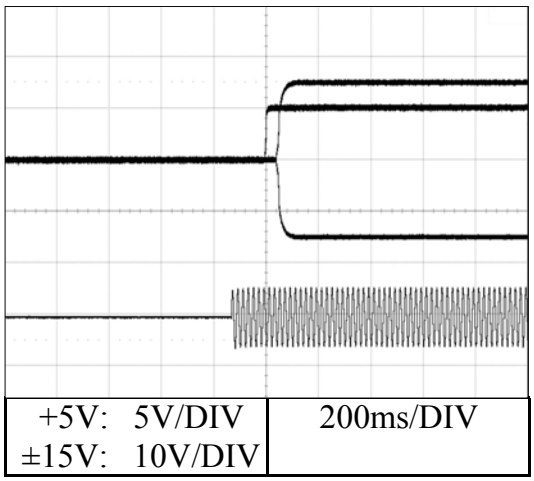
← +15V →
← +5V →
← 0V →
← -15V→
← Vin →

Iout : 100%



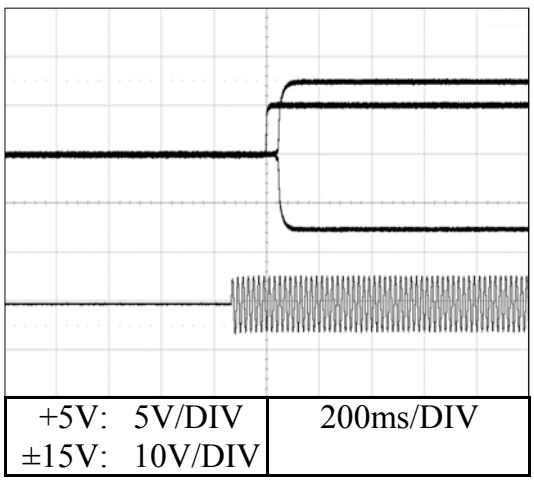
Vin : 200 VAC

Iout : 0%



← +15V →
← +5V →
← 0V →
← -15V→
← Vin →

Iout : 100%



2.5 出力立ち下がり特性

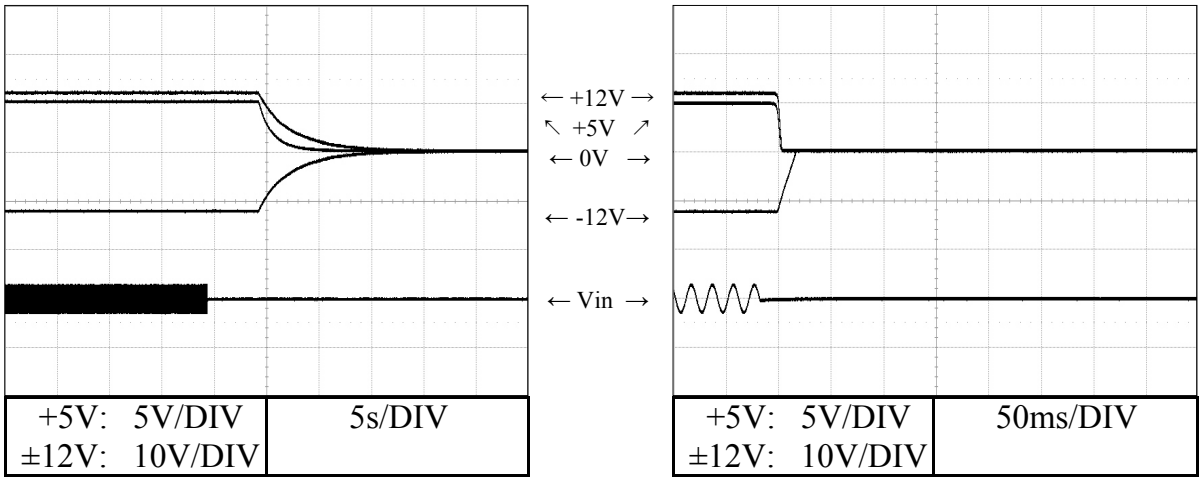
Output fall characteristics

Model : CUT75J-522

Conditions Ta : 25 ℃

Vin : 100 VAC

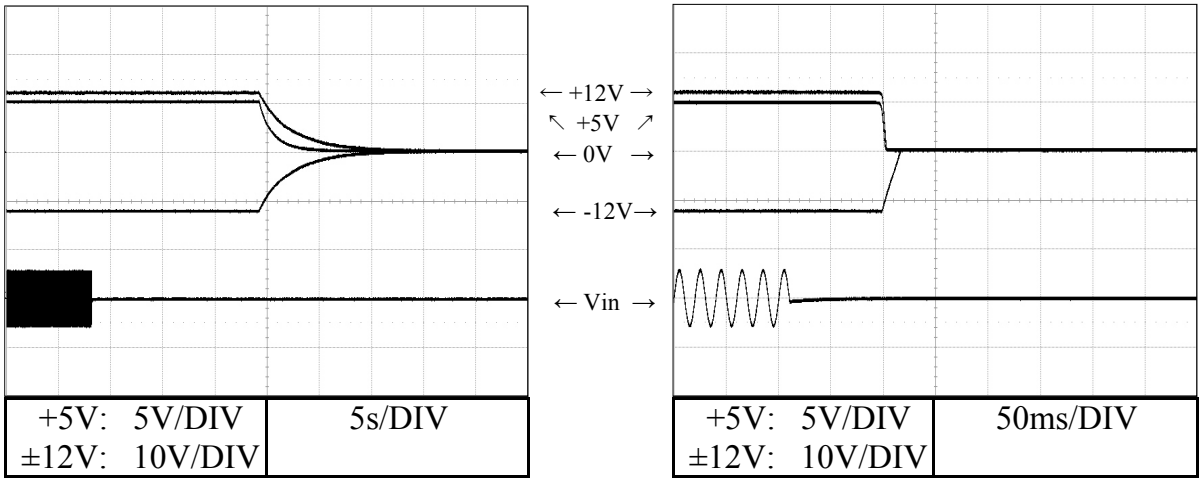
Iout : 0%



Iout : 100%

Vin : 200 VAC

Iout : 0%



Iout : 100%

2.5 出力立ち下がり特性

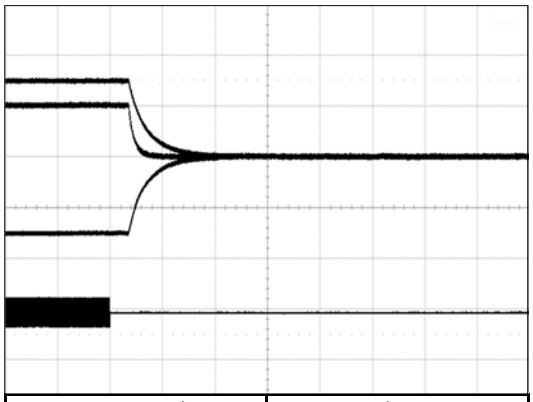
Output fall characteristics

Model : CUT75J-5FF

Conditions Ta : 25 ℃

Vin : 100 VAC

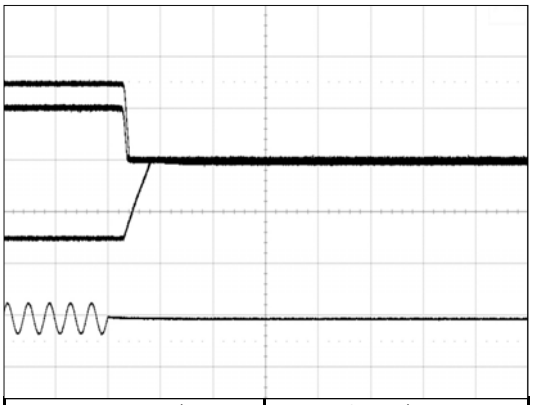
Iout : 0%



+5V: 5V/DIV ±15V: 10V/DIV	5s/DIV

← +15V →
← +5V →
← 0V →
← -15V→
← Vin →

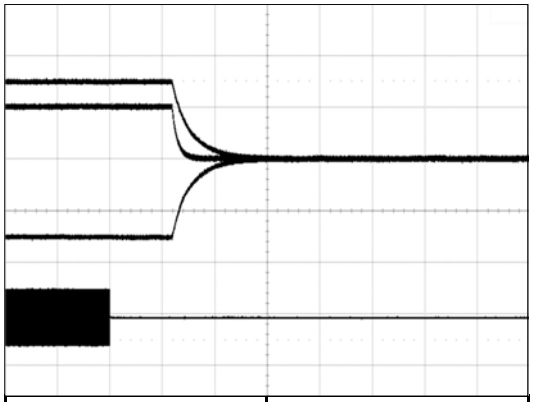
Iout : 100%



+5V: 5V/DIV ±15V: 10V/DIV	50ms/DIV

Vin : 200 VAC

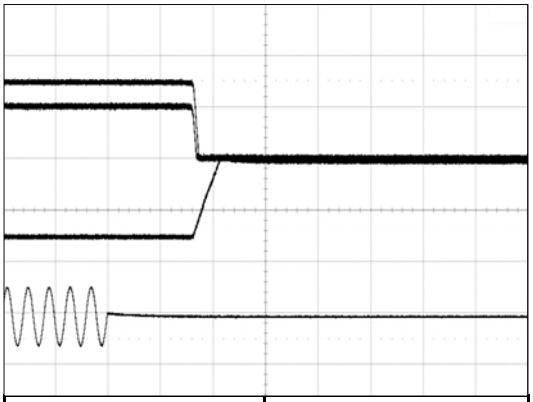
Iout : 0%



+5V: 5V/DIV ±15V: 10V/DIV	5s/DIV

← +15V →
← +5V →
← 0V →
← -15V→
← Vin →

Iout : 100%



+5V: 5V/DIV ±15V: 10V/DIV	50ms/DIV

2.6 過電流保護特性

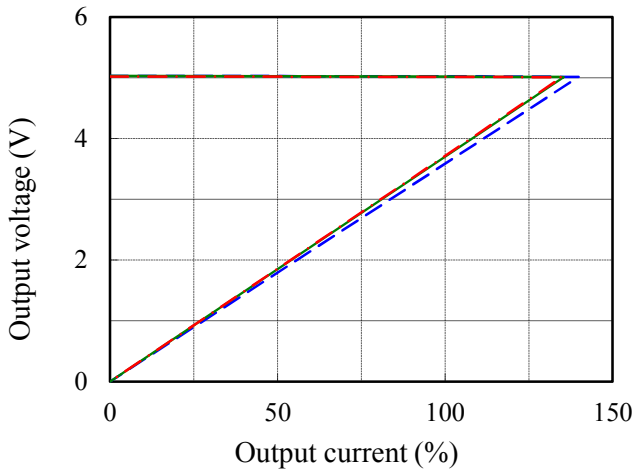
Over current protection (OCP) characteristics

Model : CUT75J-522

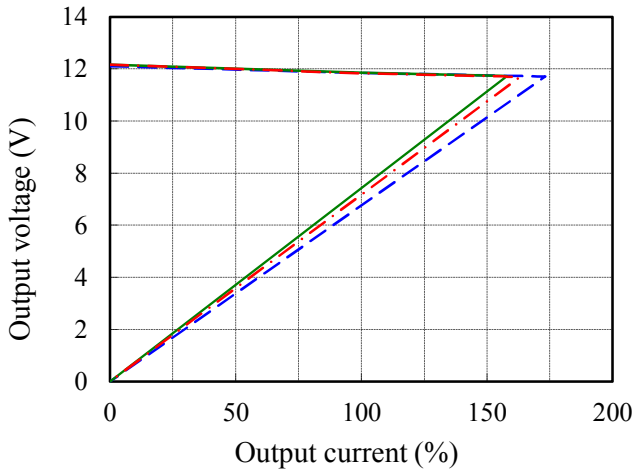
Conditions Vin : 100 VAC

Ta : -20 ℃ 25 ℃ 50 ℃

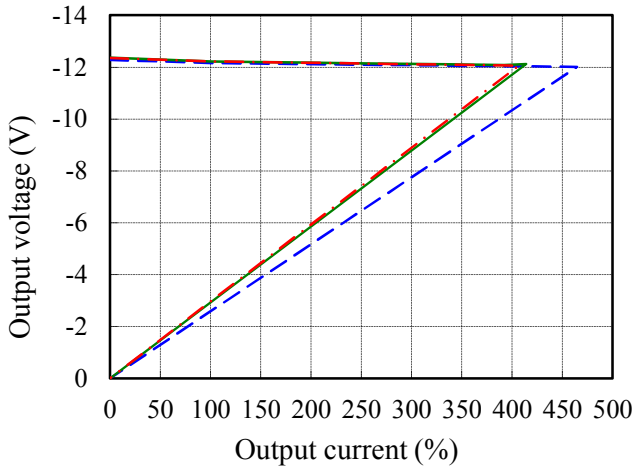
CH1: +5V



CH2: +12V



CH3: -12V

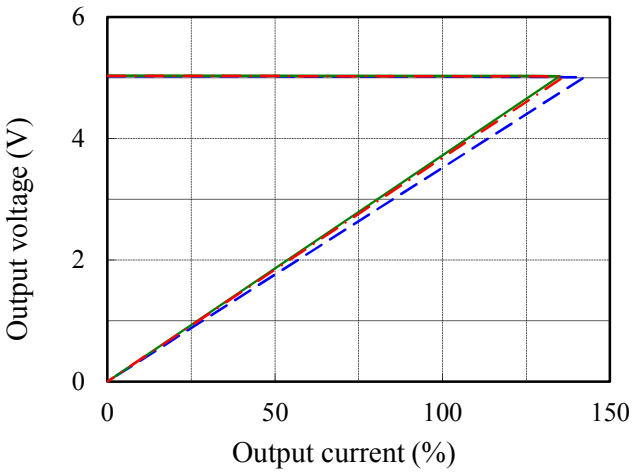


Model : CUT75J-5FF

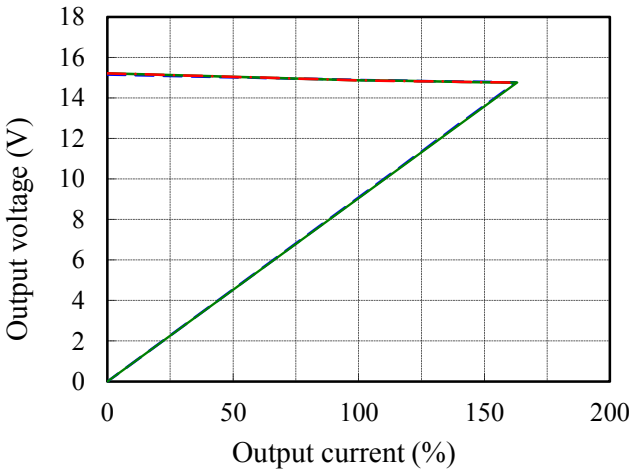
Conditions Vin : 100 VAC

Ta : -20 ℃ 25 ℃ 50 ℃

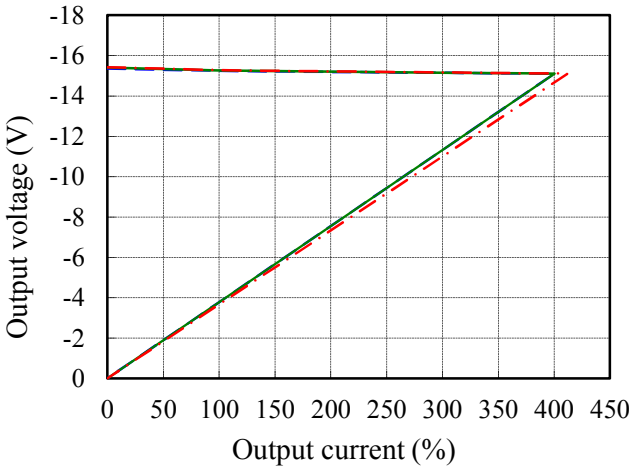
CH1: +5V



CH2: +15V



CH3: -15V

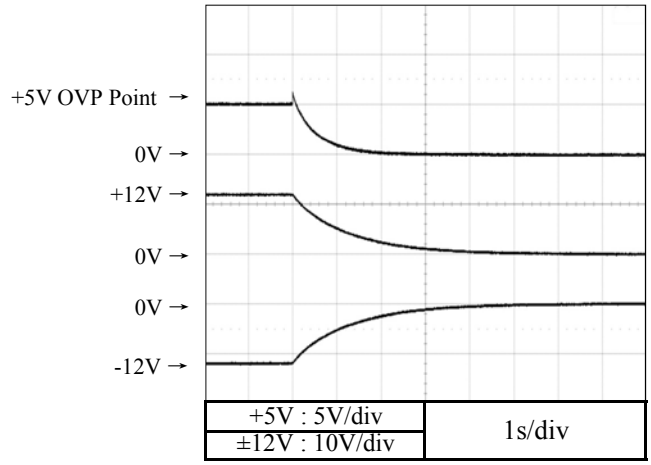


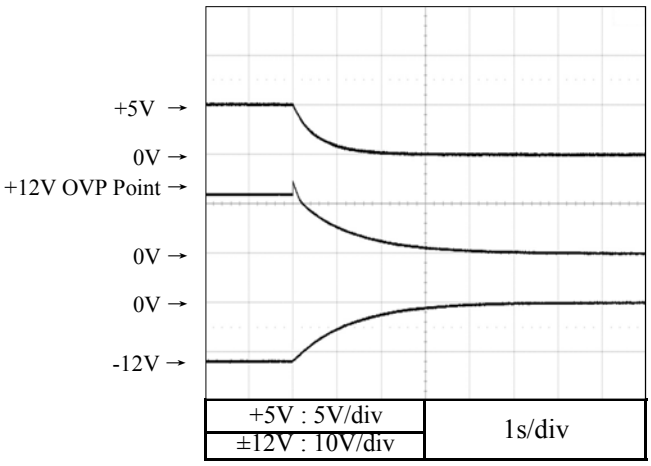
2.7 過電圧保護特性

Over voltage protection (OVP) characteristics

Model : CUT75J-522

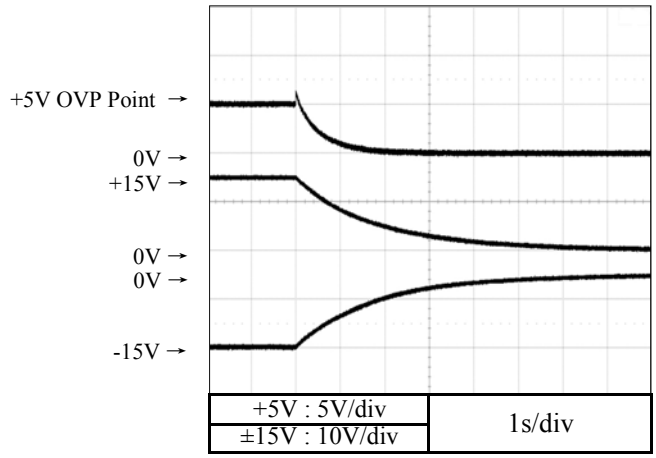
Conditions Vin : 100 VAC
Iout : 0 %
Ta : 25 ℃

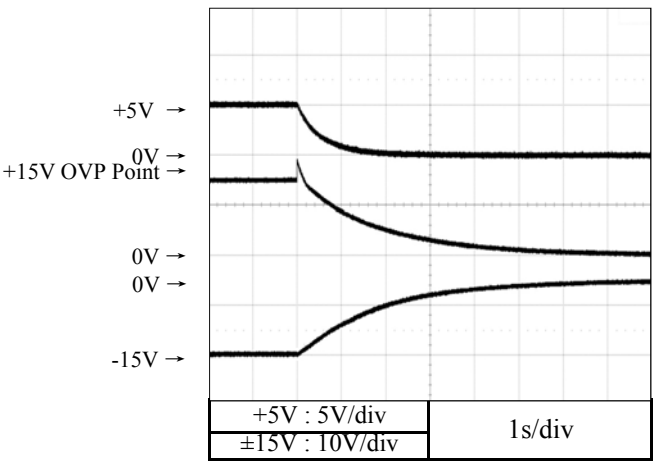




Model : CUT75J-5FF

Conditions Vin : 100 VAC
Iout : 0 %
Ta : 25 ℃





2.8 過渡応答（負荷急変）特性

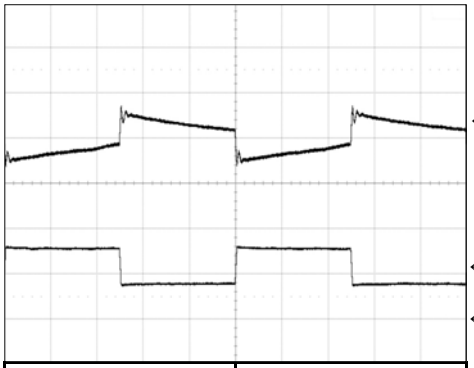
Dynamic load response characteristics
Model : CUT75J-522

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

CH1: +5V

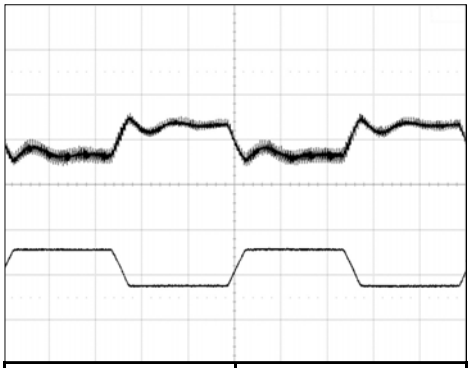
Iout : +5V : 50%↔100%
±12V : 100%

f = 100Hz



200mV/DIV	2ms/DIV
+1.41%	-1.26%

f = 1kHz

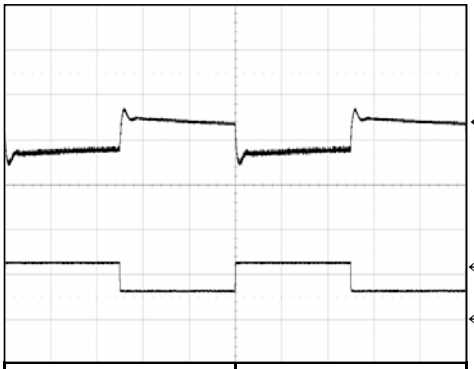


200mV/DIV	200 μ s/DIV
+1.14%	-1.16%

CH2: +12V

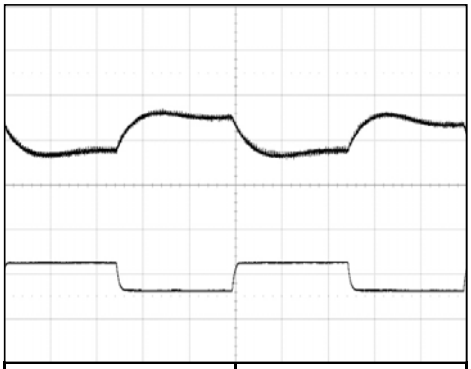
Iout : +12V : 50%↔100%
+5V, -12V : 100%

f = 100Hz



200mV/DIV	2ms/DIV
+0.31%	-0.35%

f = 1kHz

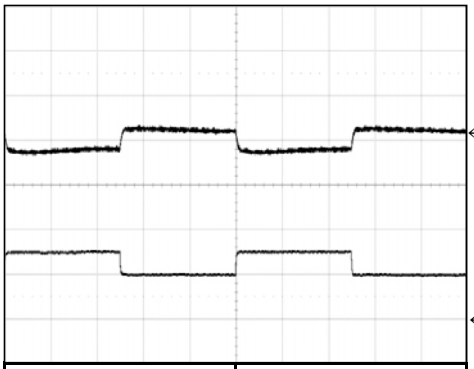


200mV/DIV	200 μ s/DIV
+0.95%	-0.65%

CH3: -12V

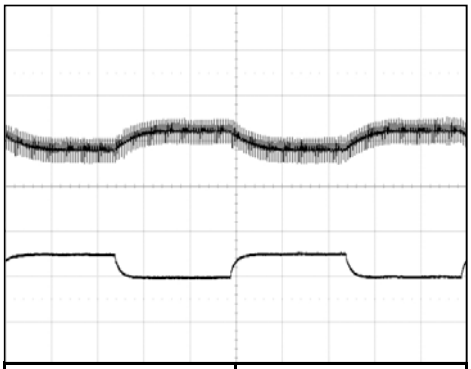
Iout : -12V : 50%↔100%
+5V, +12V : 100%

f = 100Hz



200mV/DIV	2ms/DIV
+0.28%	-0.28%

f = 1kHz



200mV/DIV	200 μ s/DIV
+0.43%	-0.42%

2.8 過渡応答（負荷急変）特性

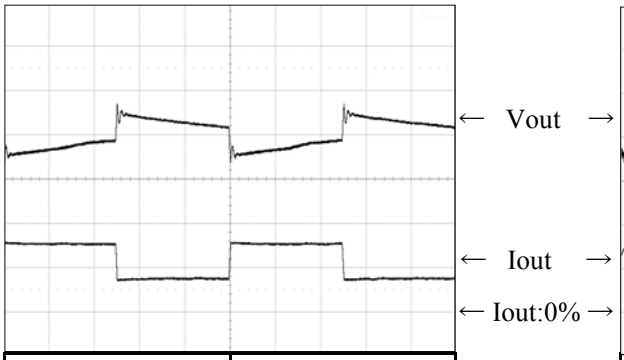
Dynamic load response characteristics
Model : CUT75J-5FF

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

CH1: +5V

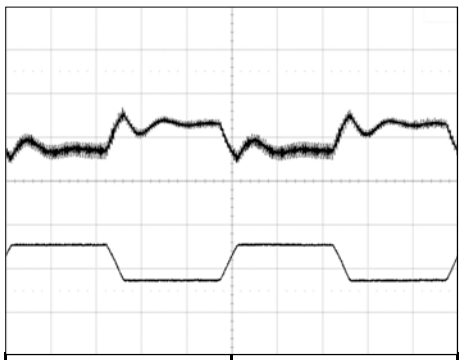
Iout : +5V : 50%↔100%
±15V : 100%

f = 100Hz



200mV/DIV	2ms/DIV
+1.36%	-1.23%

f = 1kHz

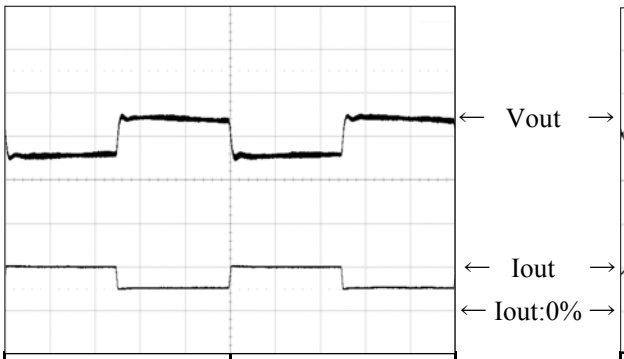


200mV/DIV	200 μ s/DIV
+1.33%	-1.17%

CH2: +15V

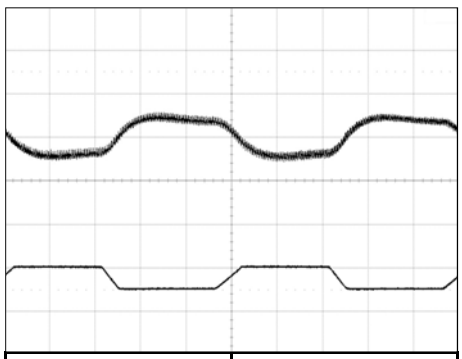
Iout : +15V : 50%↔100%
+5V, -15V : 100%

f = 100Hz



200mV/DIV	2ms/DIV
+0.68%	-0.75%

f = 1kHz

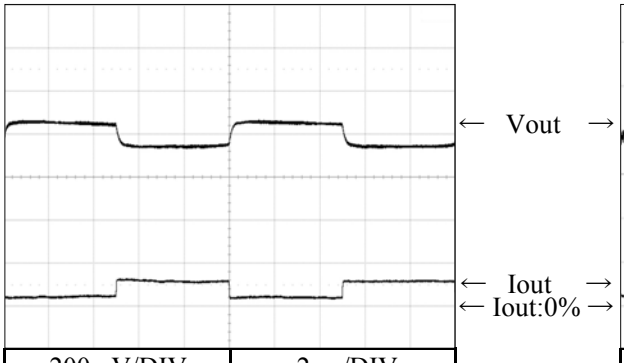


200mV/DIV	200 μ s/DIV
+0.75%	-0.75%

CH3: -15V

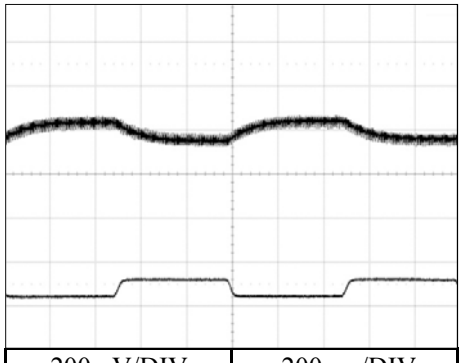
Iout : -15V : 50%↔100%
+5V, +15V : 100%

f = 100Hz



200mV/DIV	2ms/DIV
+0.22%	-0.23%

f = 1kHz



200mV/DIV	200 μ s/DIV
+0.21%	-0.24%

2.9 入力電圧瞬停特性

Response to brown out characteristics

Model : CUT75J-522

Conditions Vin : 100 VAC
Iout : 100 %
Ta : 25 ℃

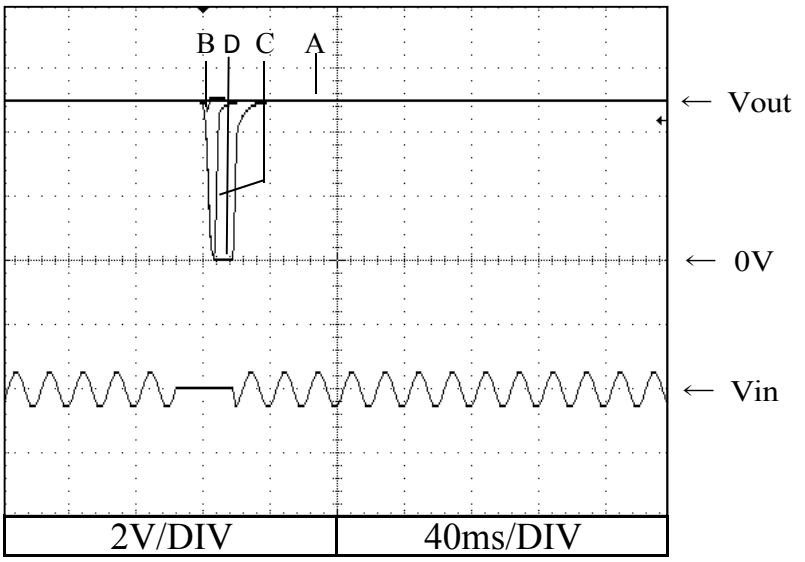
CH1: +5V

A = 14ms

B = 17ms

C = 24ms

D = 34ms



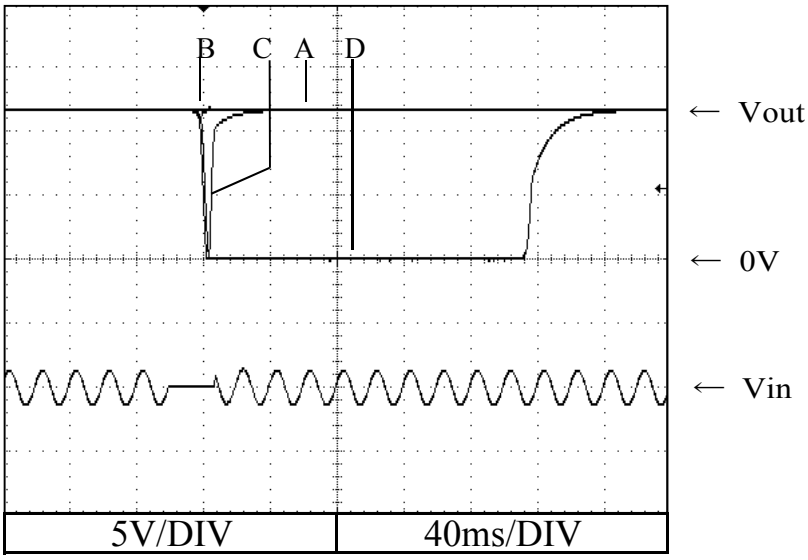
CH2: +12V

A = 14ms

B = 18ms

C = 23ms

D = 27ms



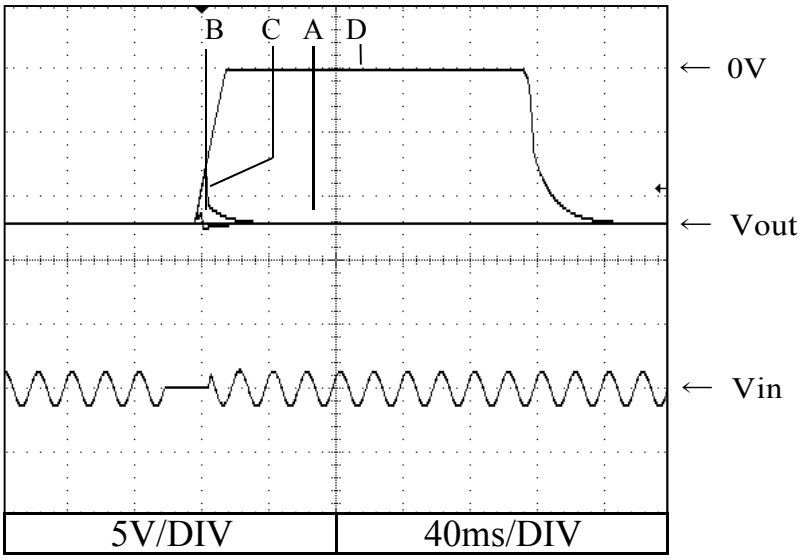
CH3: -12V

A = 17ms

B = 19ms

C = 23ms

D = 26ms



2.9 入力電圧瞬停特性

Response to brown out characteristics

Model : CUT75J-522

Conditions Vin : 200 VAC
Iout : 100 %
Ta : 25 ℃

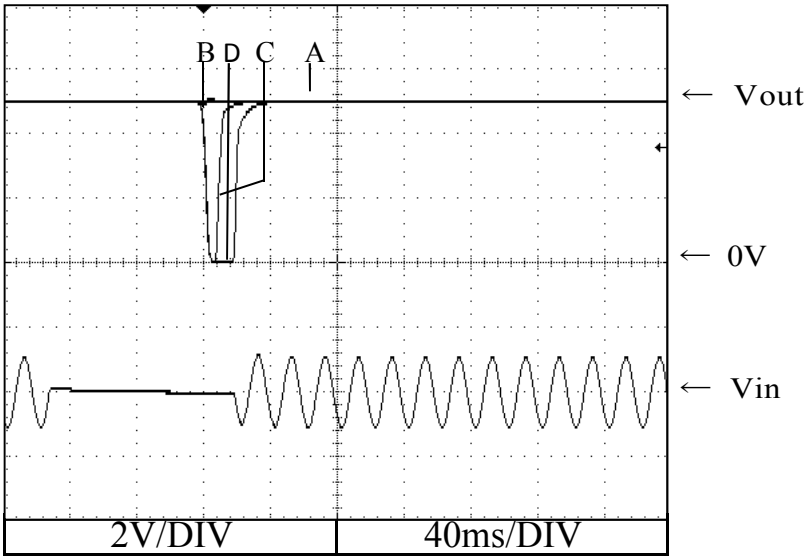
CH1: +5V

A = 85ms

B = 90ms

C = 98ms

D = 110ms



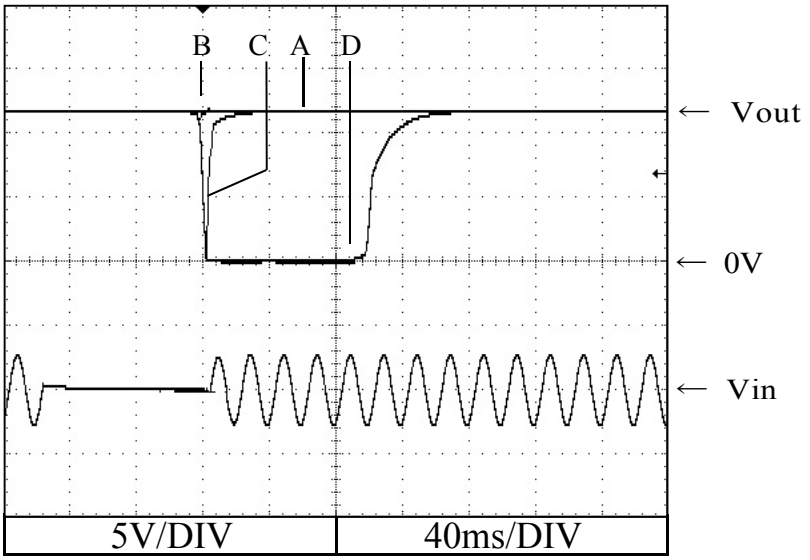
CH2: +12V

A = 88ms

B = 93ms

C = 97ms

D = 103ms



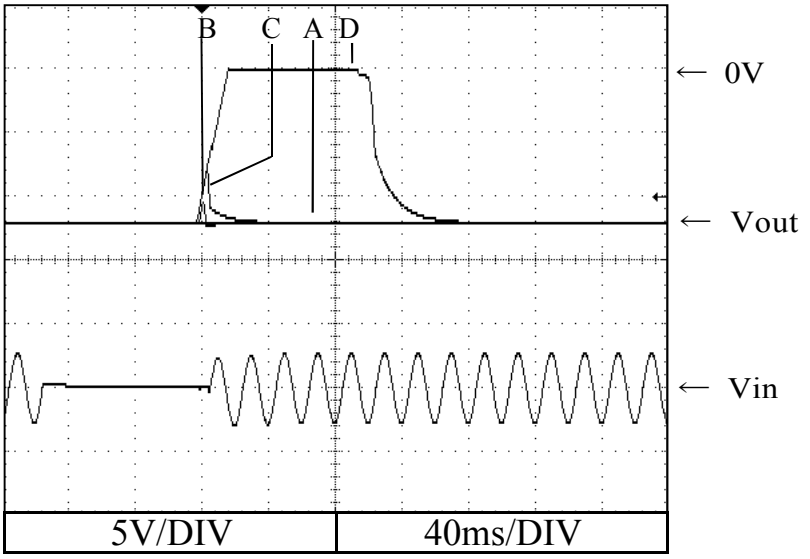
CH3: -12V

A = 88ms

B = 93ms

C = 96ms

D = 99ms



2.9 入力電圧瞬停特性

Response to brown out characteristics

Model : CUT75J-5FF

Conditions Vin : 100 VAC
Iout : 100 %
Ta : 25 ℃

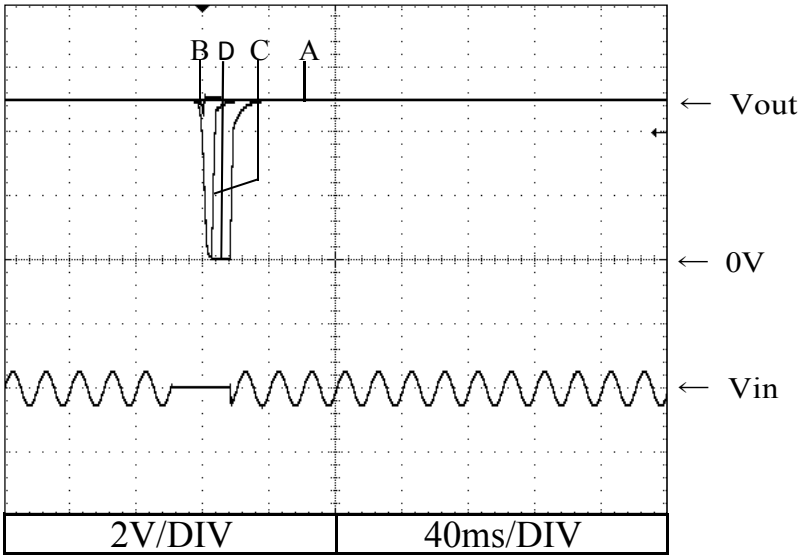
CH1: +5V

A = 12ms

B = 17ms

C = 24ms

D = 35ms



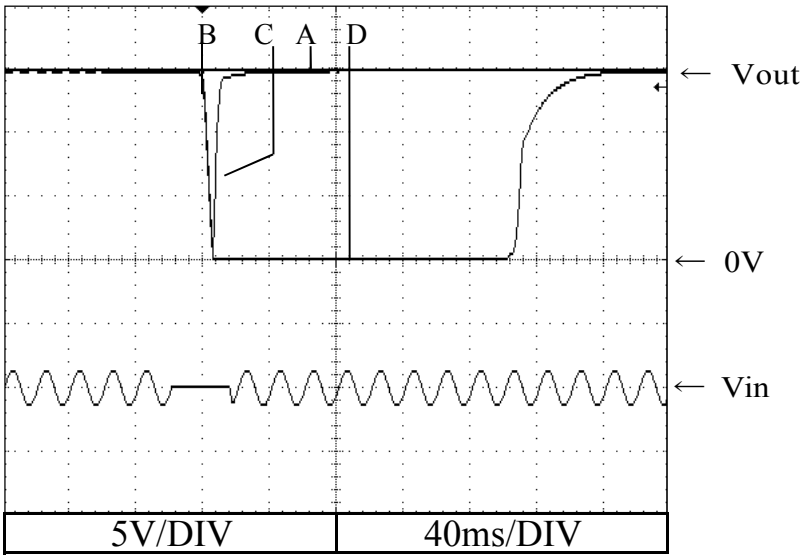
CH2: +15V

A = 12ms

B = 17ms

C = 24ms

D = 30ms



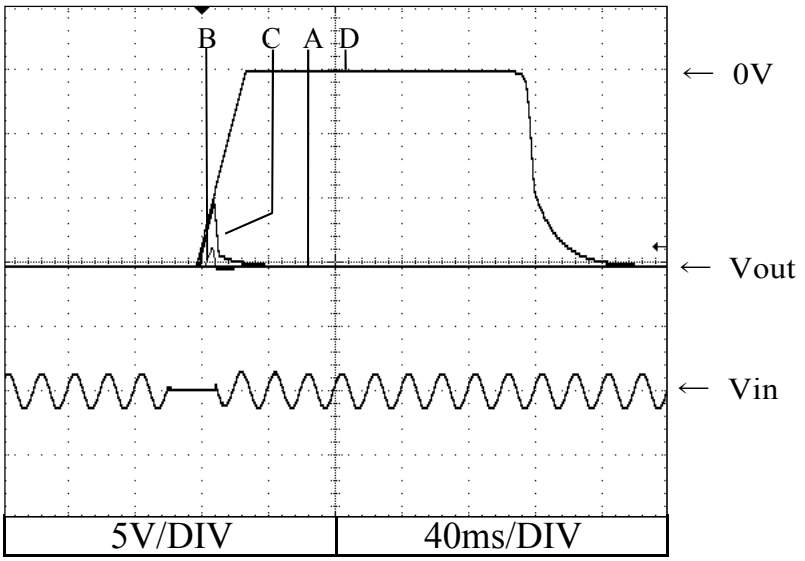
CH3: -15V

A = 16ms

B = 19ms

C = 25ms

D = 29ms



2.9 入力電圧瞬停特性

Response to brown out characteristics
Model : CUT75J-5FF

Conditions Vin : 200 VAC
Iout : 100 %
Ta : 25 ℃

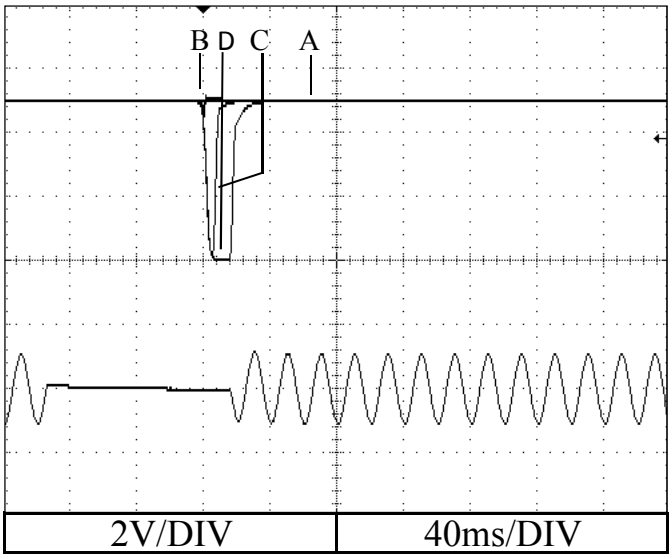
CH1: +5V

A = 85ms

B = 93ms

C = 100ms

D = 110ms



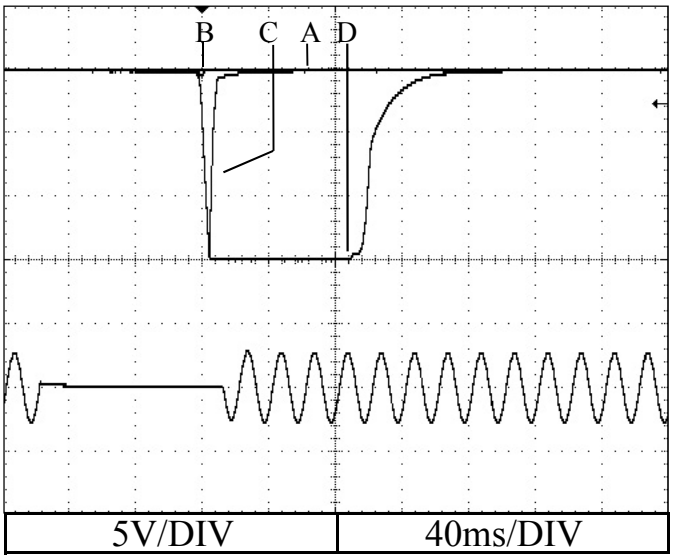
CH2: +15V

A = 82ms

B = 95ms

C = 101ms

D = 107ms



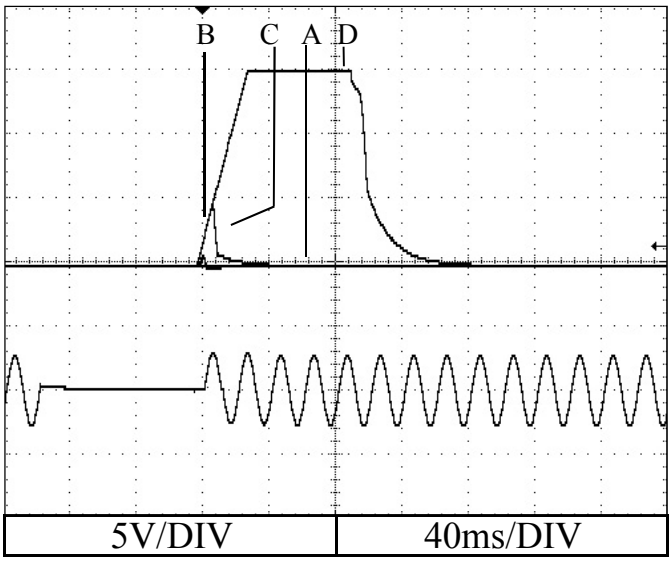
CH3: -15V

A = 88ms

B = 95ms

C = 101ms

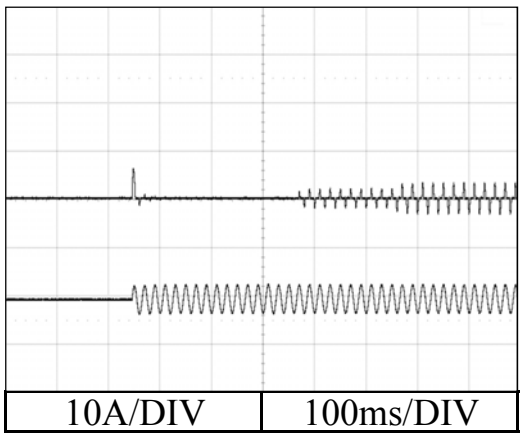
D = 105ms



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

Conditions Vin : 100 VAC
Iout : 100 %
Ta : 25 ℃

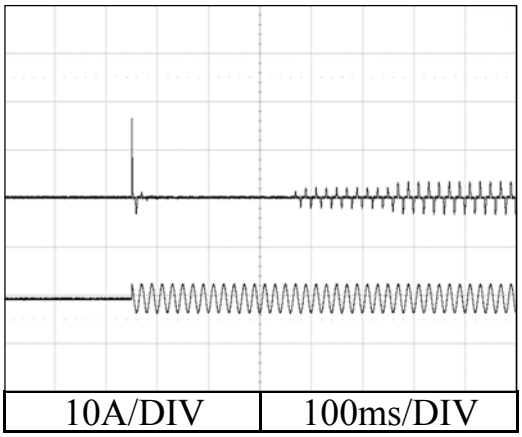
Switch on phase angle of input AC voltage
ϕ = 0°



← Iin →

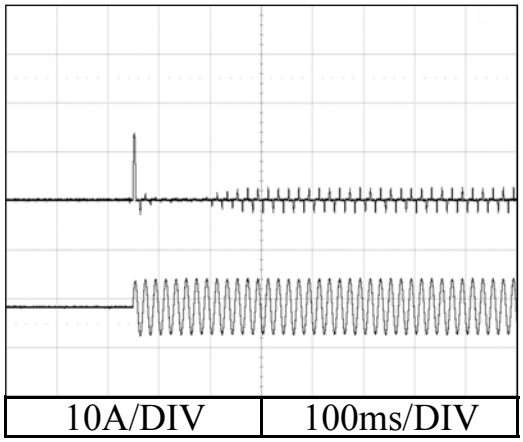
← Vin →

Switch on phase angle of input AC voltage
ϕ = 90°



Conditions Vin : 200 VAC
Iout : 100 %
Ta : 25 ℃

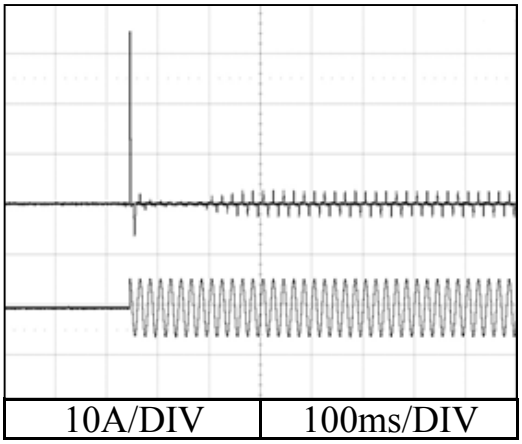
Switch on phase angle of input AC voltage
ϕ = 0°



← Iin →

← Vin →

Switch on phase angle of input AC voltage
ϕ = 90°

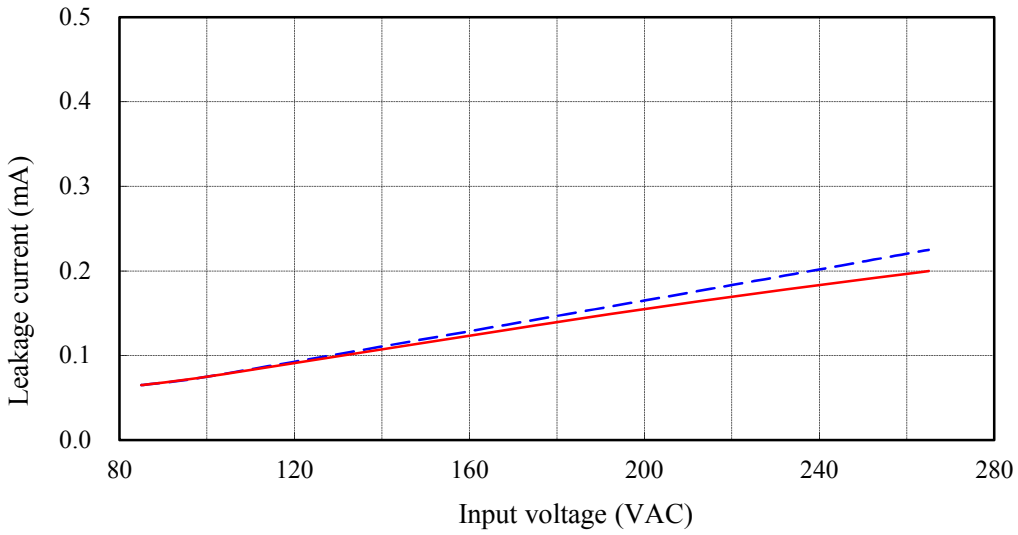


2.11 リーク電流特性
Leakage current characteristics

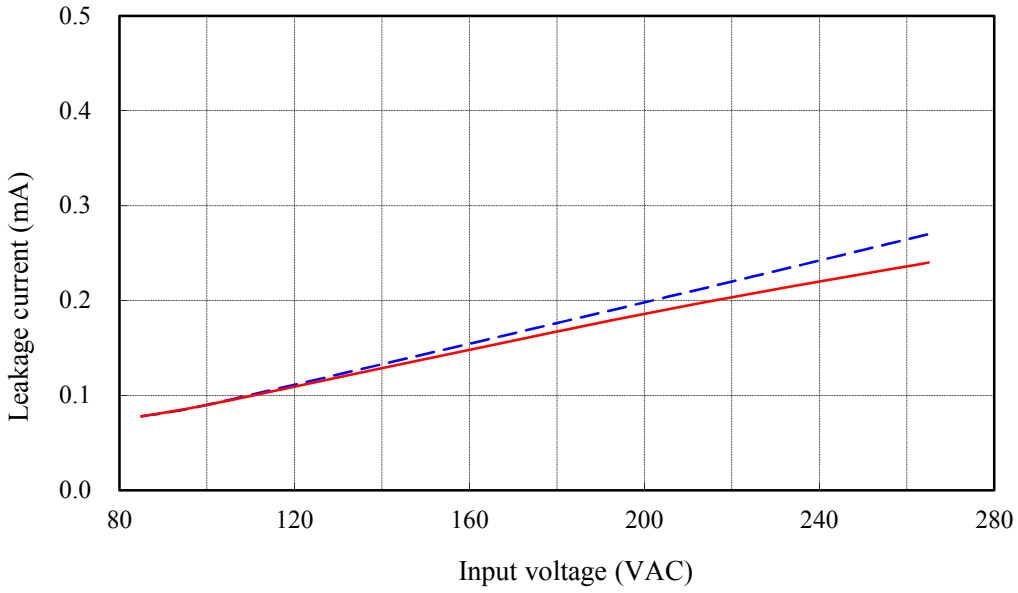
Conditions Iout : 0 %
100 %
Ta : 25 ℃

Equipment used : 228 (Simpson)

f : 50 Hz



f : 60 Hz

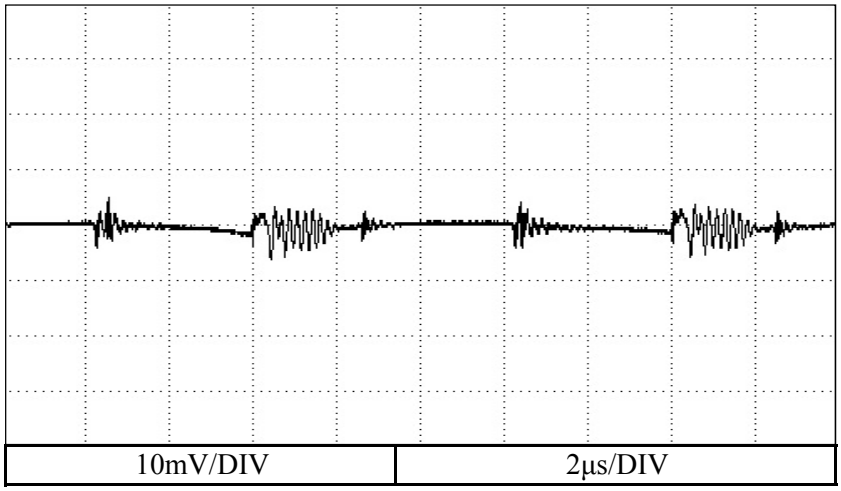


2.12 出力リップル、ノイズ波形

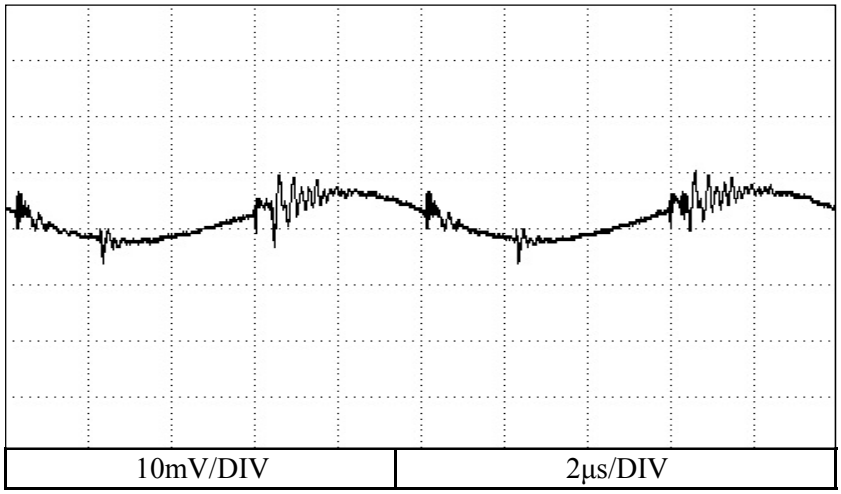
Output ripple and noise waveform　　Conditions　Vin : 100VAC

Model : CUT75J-522　　Ta : 25℃

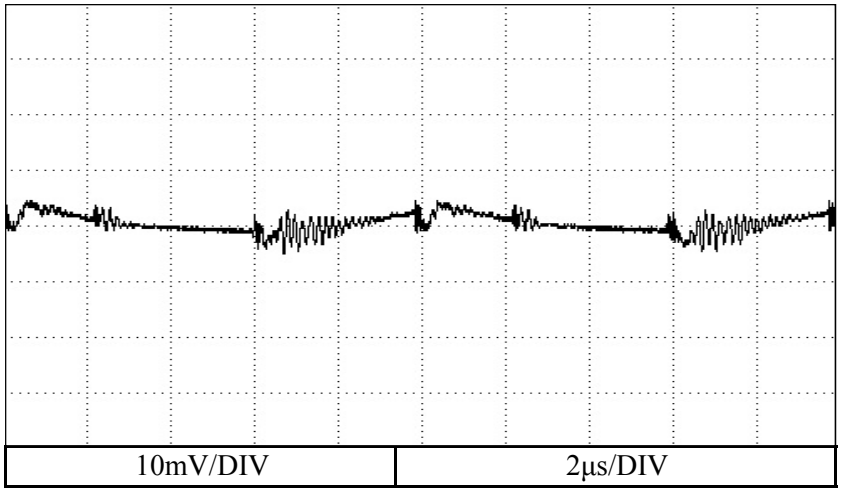
CH1: +5V　　Iout : 100%



CH2: +12V　　Iout : 100%



CH3: -12V　　Iout : 100%

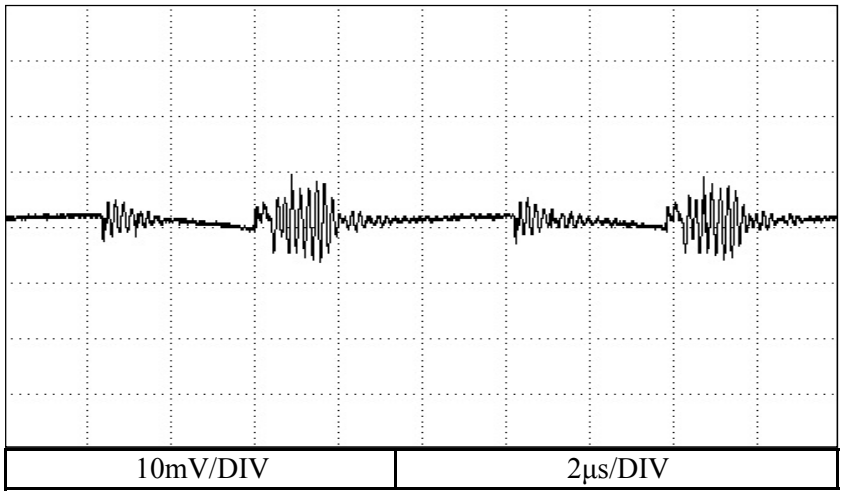


2.12 出力リップル、ノイズ波形

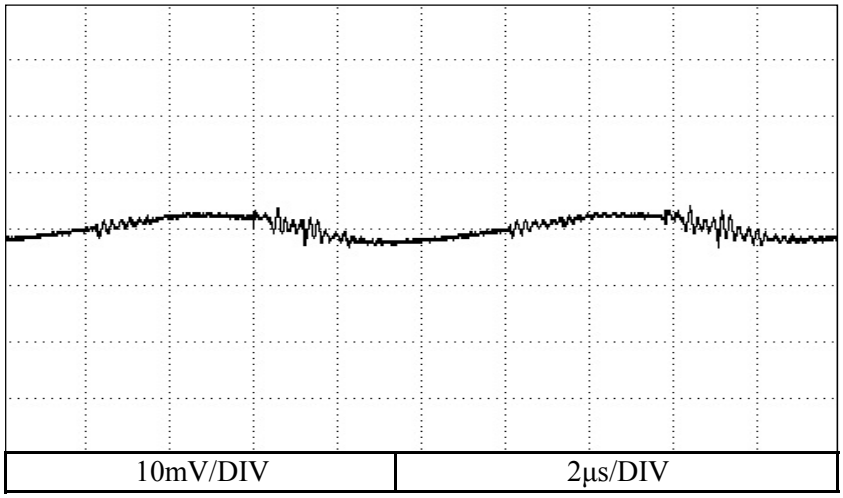
Output ripple and noise waveform　　Conditions　Vin : 100VAC

Model : CUT75J-5FF　　Ta : 25℃

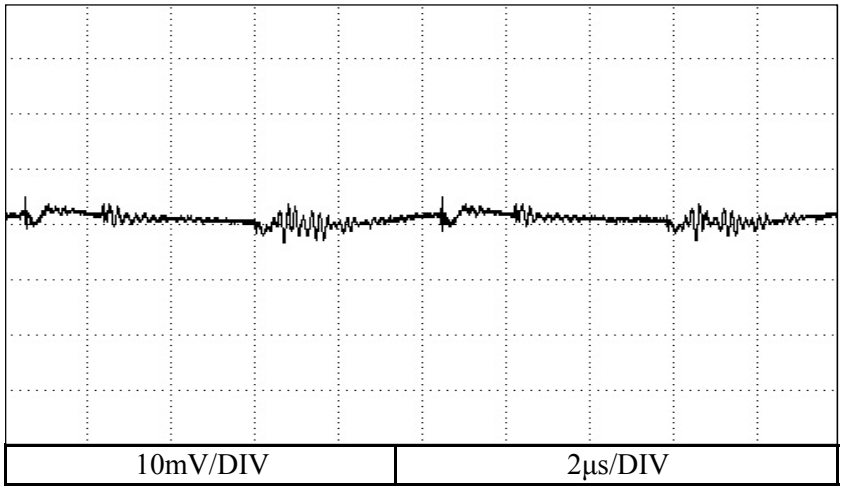
CH1: +5V　　Iout : 100%



CH2: +15V　　Iout : 100%



CH3: -15V　　Iout : 100%



2.13 ＥＭＩ特性

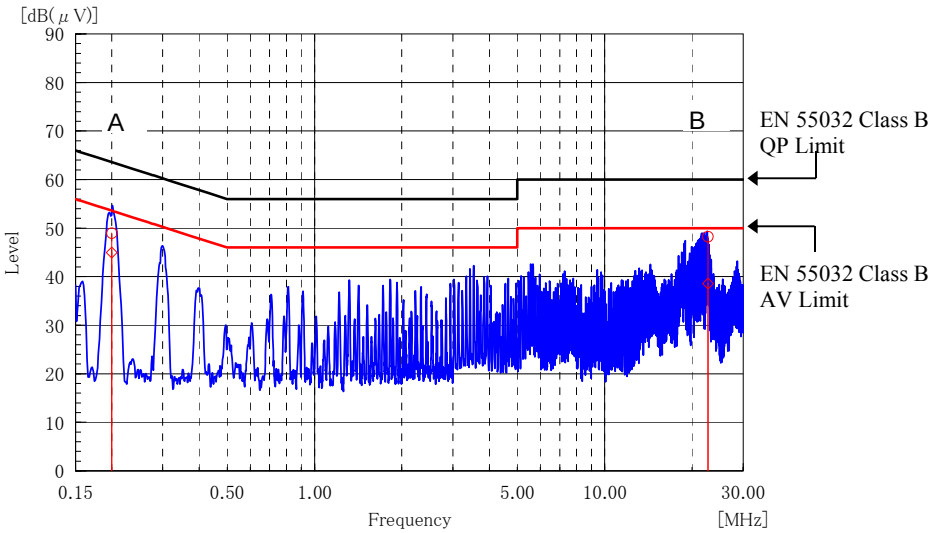
Electro-Magnetic Interference characteristics
Model : CUT75J-522

Conditions Vin : 230 VAC
Iout : 100 %
Ta : 25 ℃

雑音端子電圧
Conducted Emission

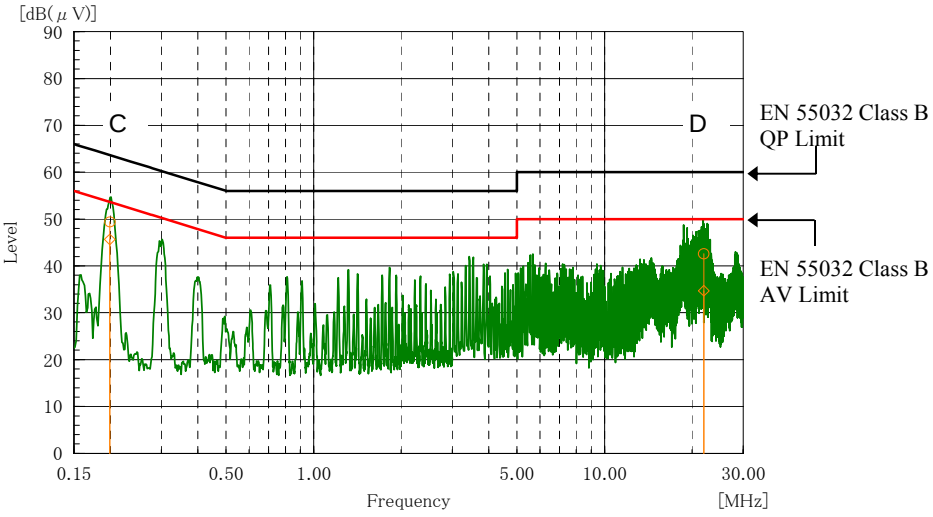
Phase : L

	Point A (200kHz)	
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	63.6	49.0
AV	53.6	45.0
	Point B (22.7MHz)	
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	60.0	48.3
AV	50.0	38.6



Phase : N

	Point C (200kHz)	
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	63.6	49.4
AV	53.6	45.7
	Point D (21.9MHz)	
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	60.0	42.6
AV	50.0	34.7



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

2.13 ＥＭＩ特性

Electro-Magnetic Interference characteristics

Model : CUT75J-5FF

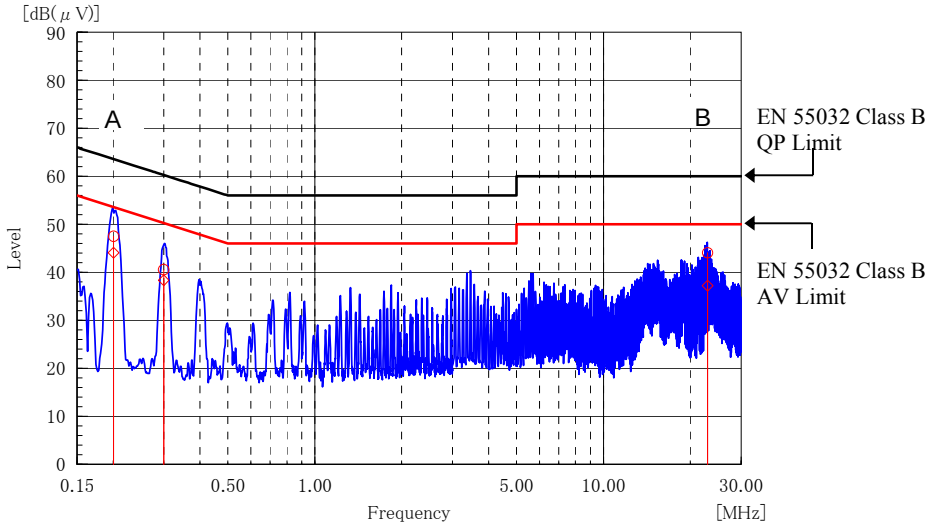
Conditions Vin : 230 VAC
Iout : 100 %
Ta : 25 ℃

雑音端子電圧

Conducted Emission

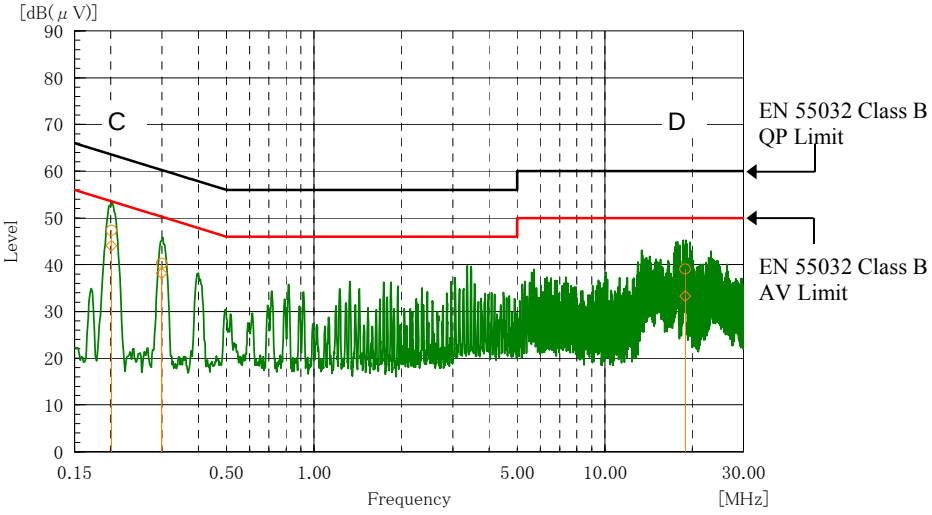
Phase : L

Ref. Data	Point A (201kHz) Limit (dBuV)	Measure (dBuV)
QP	63.6	47.5
AV	53.6	44.1
Ref. Data	**Point B (23.0MHz) Limit (dBuV)**	**Measure (dBuV)**
QP	60.0	44.1
AV	50.0	37.2



Phase : N

Ref. Data	Point C (201kHz) Limit (dBuV)	Measure (dBuV)
QP	63.6	47.4
AV	53.6	44.1
Ref. Data	**Point D (18.9MHz) Limit (dBuV)**	**Measure (dBuV)**
QP	60.0	39.1
AV	50.0	33.3



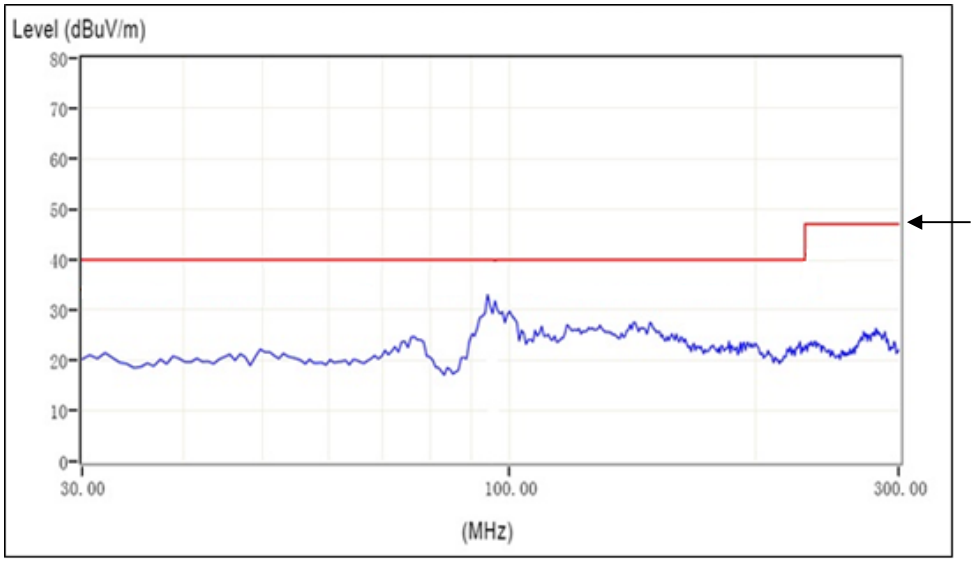
EN55011-B,VCCI-B,FCC-Bの限界値はEN55032 class Bの限界値と同じ
Limit of EN55011-B,VCCI-B,FCC-B are same as its EN55032 class B.

2.13 ＥＭＩ特性

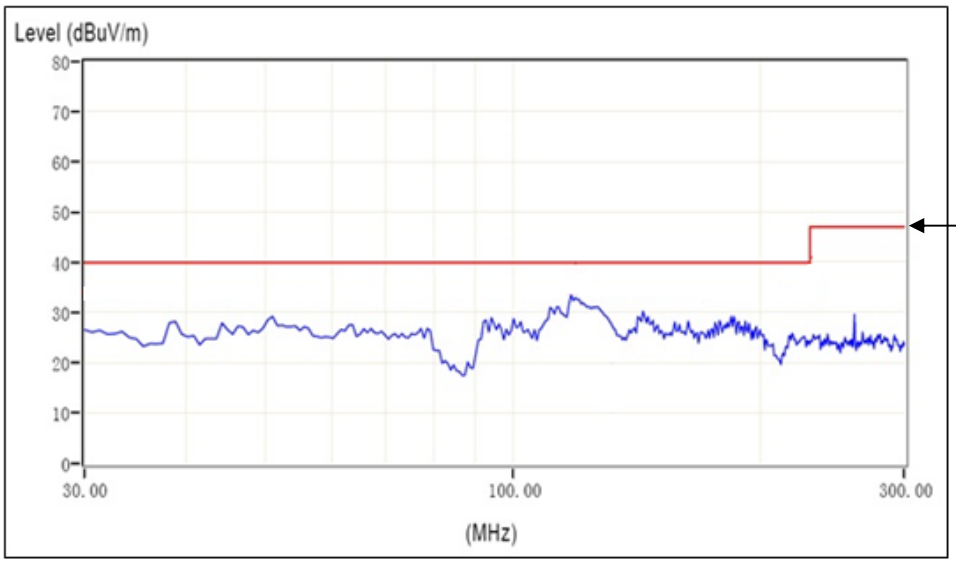
Electro-Magnetic Interference characteristics　　Conditions　Vin: 230VAC
Model : CUT75J-522　　Io: 100%
Ta: 25℃

雑音電界強度
Radiated Emission

Polarity: Horizontal



Polarity: Vertical

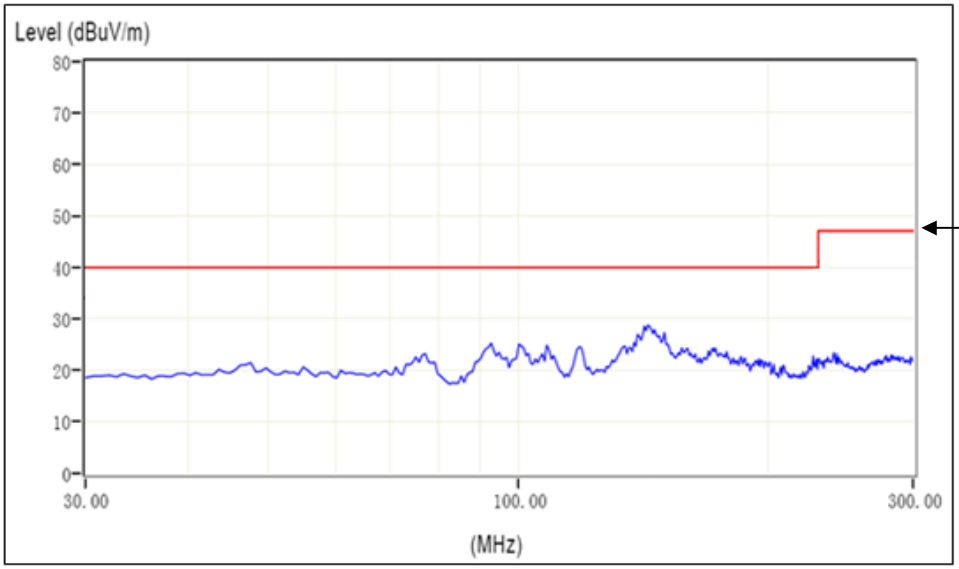


2.13 ＥＭＩ特性

Electro-Magnetic Interference characteristics　　Conditions　Vin: 230VAC
Model : CUT75J-5FF　　Io: 100%
Ta: 25℃

雑音電界強度
Radiated Emission

Polarity: Horizontal



Polarity: Vertical