

**DRJ240-24-1**

**EVALUATION DATA**

**型式データ**

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## 2. 特性データ Characteristics

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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

※ 当社測定条件における結果であり、参考値としてお考え願います。

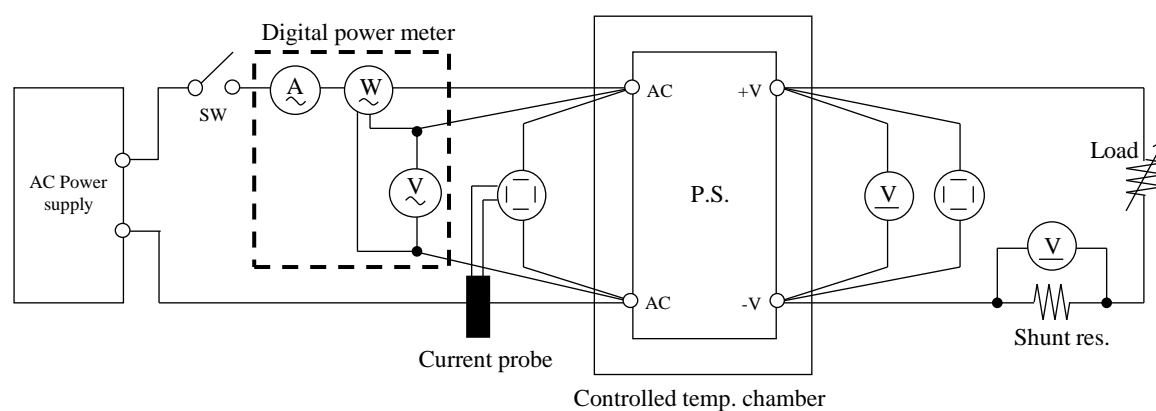
Test results are reference data based on our measurement condition.

## 1. 測定方法 Evaluation Method

### 1.1 測定回路 Circuit used for determination

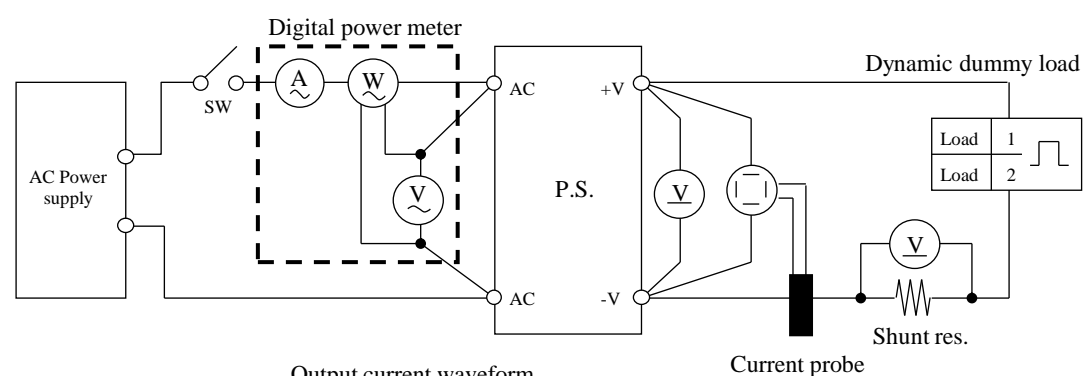
#### 測定回路1 Circuit 1 used for determination

- 静特性 Steady state data
- 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
- 入力電圧瞬停特性 Response to brown out characteristics
- 高調波成分 Input current harmonics
- 入力電流波形 Input current waveform

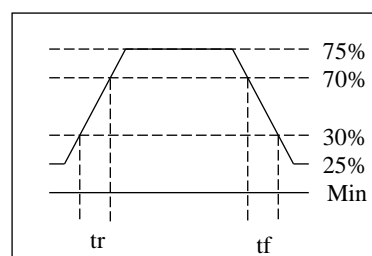


#### 測定回路2 Circuit 2 used for determination

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

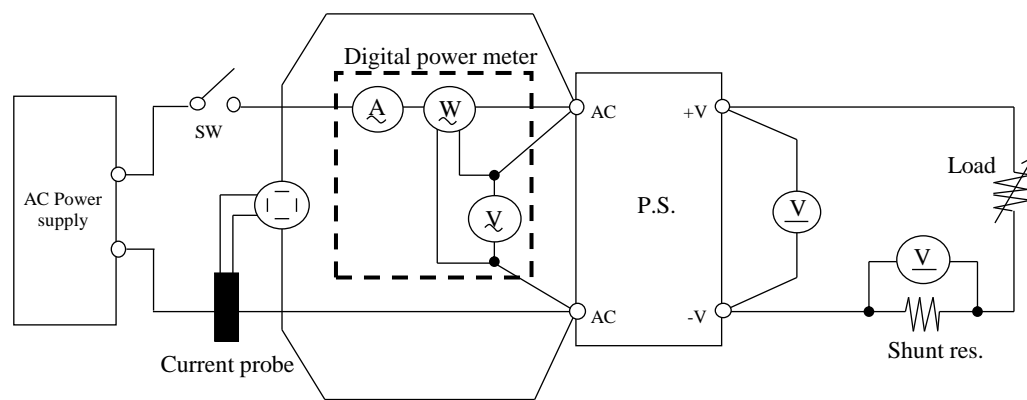


Output current waveform  
Iout 25% <=> 75%



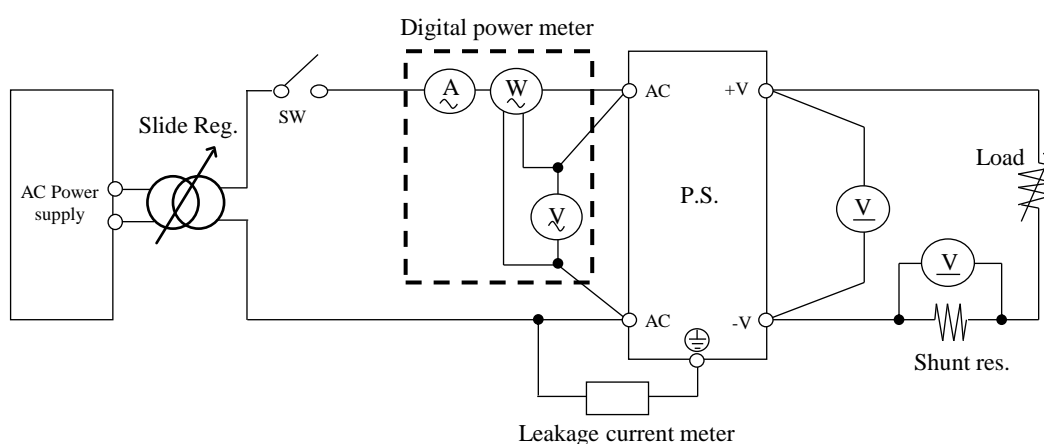
測定回路3 Circuit 3 used for determination

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



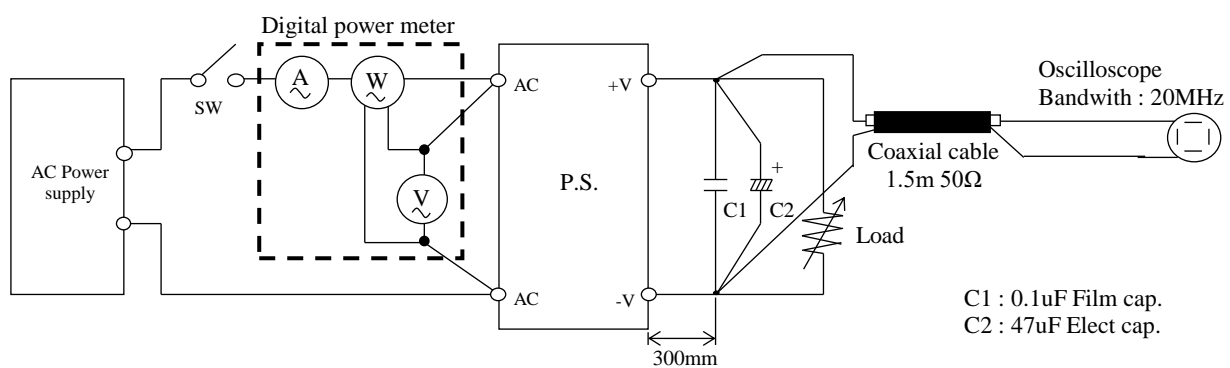
測定回路4 Circuit 4 used for determination

・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

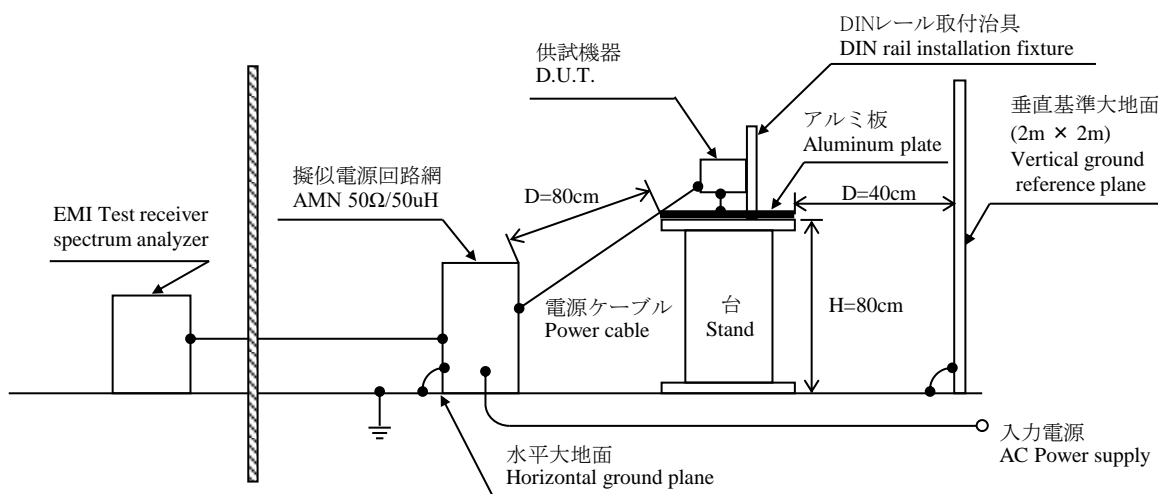


測定構成 Configuration used for determination

・EMI特性 Electro-Magnetic Interference characteristics

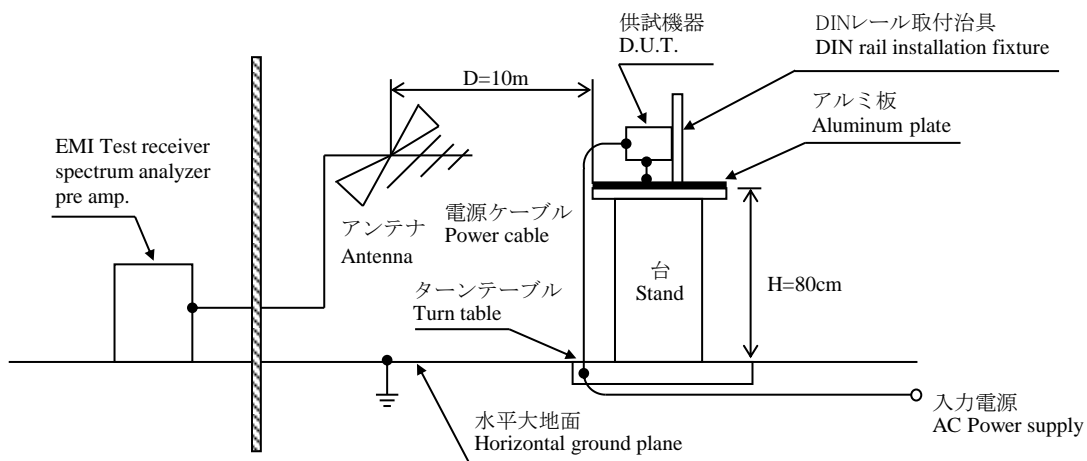
(a) 雑音端子電圧 (帰還ノイズ)

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	YOKOGAWA	DL1740/DL1740E
2	DIGITAL MULTIMETER	AGILENT	34970A
3	DIGITAL POWER METER	HIOKI	3333
4	CURRENT PROBE/AMPLIFIER	YOKOGAWA	701931
5	DATA ACQUISITION UNIT	AGILENT	34970A
6	ELECTRONIC LOAD	CHROMA	63112A
7	CONTROLLED TEMP. CHAMBER	ESPEC	SH-641
8	LEAKAGE CURRENT METER	SIMPSON	228
9	AC SOURCE	CHROMA	61505
10	AC SOURCE (CE-UL Lab)	KEYSIGHT TECHNOLOGIES	6813B
11	EMI TEST RECEIVER (CE-UL Lab)	ROHDE & SCHWARZ	ES17
12	LISN (CE-UL Lab)	SCHAFFNER LISN	NNB 41
13	LISN (CE-UL Lab)	EMCO LISN (AE)	3825/2
14	EMI TEST RECEIVER (RE-UL Lab)	ROHDE & SCHWARZ 100Hz-26.5Ghz	ESU26
15	ANTENNA (BILOG) (RE-UL Lab)	TESEQ	CBL6112B
16	ANTENNA (HORN) (RE-UL Lab)	EMCO	3115
17	PRE AMP (RE-UL Lab)	HP	8447D
18	PRE AMP (RE-UL Lab)	TOYO	TPA0108-40

## 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

24V
-----

#### 1. Regulation - line and load

Condition Ta : 25°C

Iout \ Vin	85VAC	115VAC	230VAC	264VAC	line regulation	
0%	24.101	24.101	24.101	24.101	0mV	0.000%
50%	24.065	24.065	24.065	24.064	1mV	0.004%
100%	24.032	24.032	24.031	24.031	1mV	0.004%
load	69mV	69mV	70mV	70mV		
regulation	0.287%	0.287%	0.292%	0.292%		

#### 2. Temperature drift

Condition Vin : 115VAC

Iout : 100%

Ta	-25°C	25°C	55°C	temperature stability	
Vout	23.951V	24.032V	24.042V	91mV	0.379%

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

Condition Ta : 25°C

Iout : 100%

Start up voltage (Vin)	80VAC
Drop out voltage (Vin)	61VAC

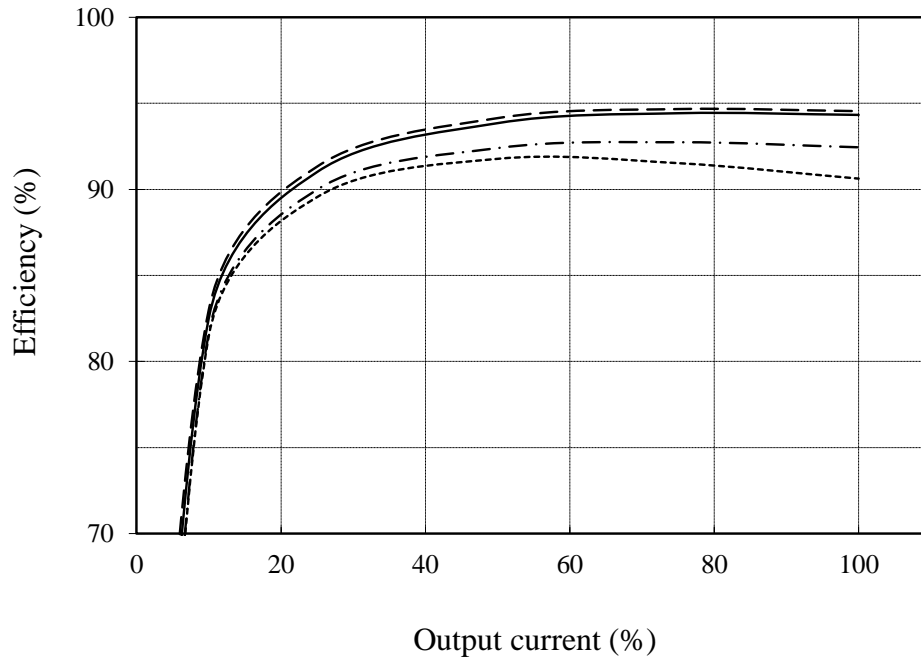


(2) 効率対出力電流

Efficiency vs. Output current

Conditions Vin : 85VAC -----  
 : 115VAC -.-.-.-  
 : 230VAC ————  
 : 264VAC - - - - -  
 Ta : 25°C

24V



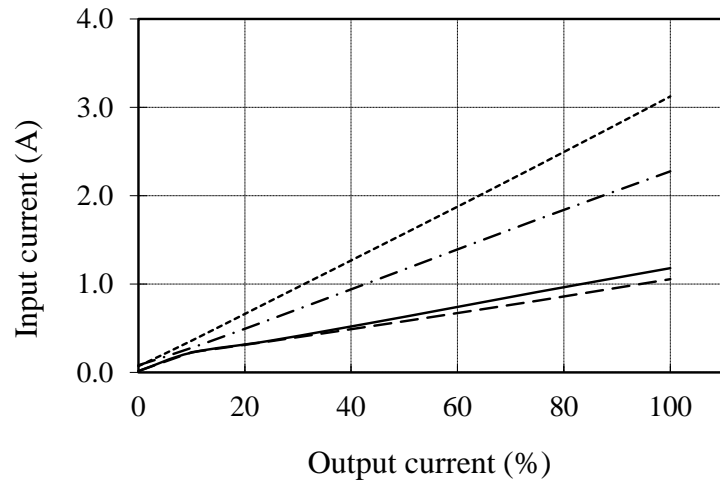
(3) 入力電流対出力電流

Input current vs. Output current

Conditions Vin : 85VAC -----  
 : 115VAC -.-.-.-  
 : 230VAC \_\_\_\_\_  
 : 264VAC - - - - -  
 Ta : 25°C

24V

Vin	Input current
	Iout : 0%
85VAC	0.071A
115VAC	0.081A
230VAC	0.014A
264VAC	0.016A



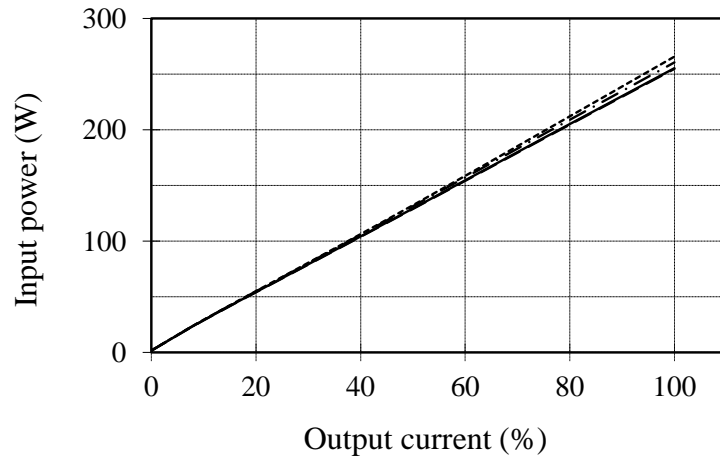
(4) 入力電力対出力電流

Input power vs. Output current

Conditions Vin : 85VAC -----  
 : 115VAC -.-.-.-  
 : 230VAC \_\_\_\_\_  
 : 264VAC - - - - -  
 Ta : 25°C

24V

Vin	Input power
	Iout : 0%
85VAC	1.68W
115VAC	1.64W
230VAC	1.60W
264VAC	1.58W

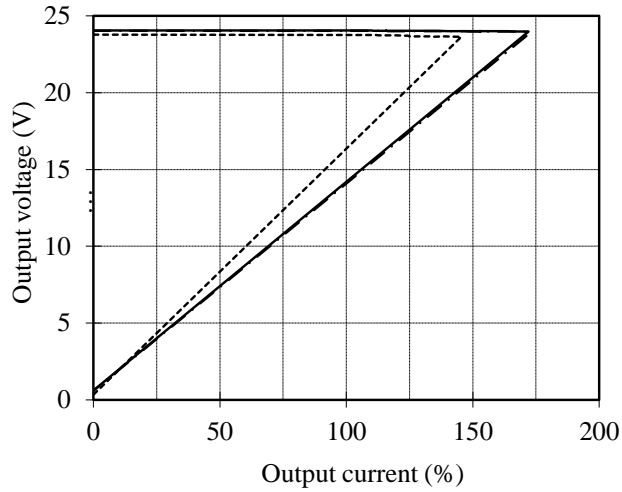


2.2 過電流保護特性

Over current protection (OCP) characteristics

Conditions Vin : 115VAC  
 Ta : -25°C -----  
 25°C - - - - -  
 55°C ———

24V

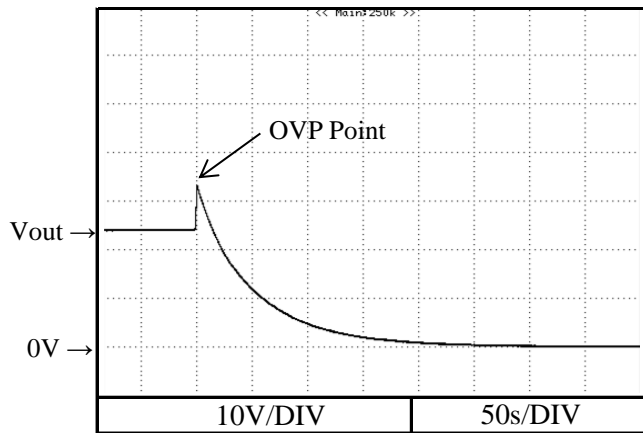


2.3 過電壓保護特性

Over voltage protection (OVP) characteristics

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

24V



2.4 出力立ち上がり特性

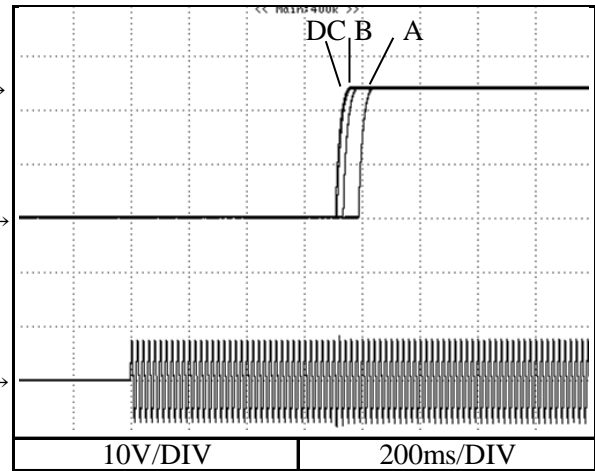
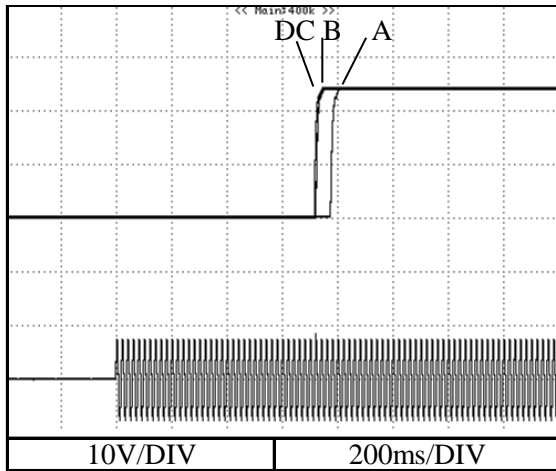
Output rise characteristics

Conditions Vin: 85VAC (A)  
 : 115VAC (B)  
 : 230VAC (C)  
 : 264VAC (D)  
 Ta: 25°C

24V

Iout : 0%

Iout : 100%



2.5 出力立ち下がり特性

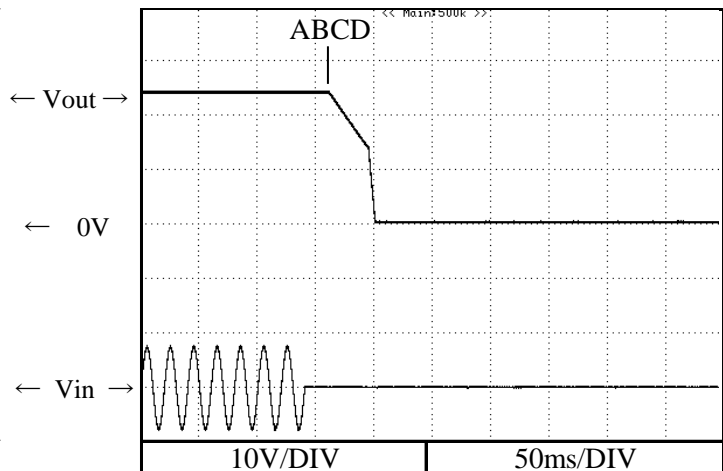
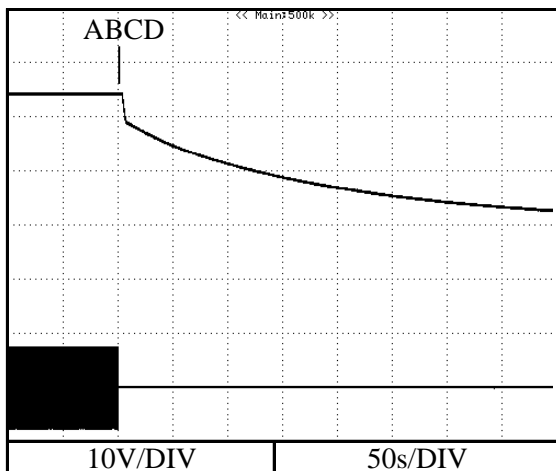
Output fall characteristics

Conditions Vin: 85VAC (A)  
 : 115VAC (B)  
 : 230VAC (C)  
 : 264VAC (D)  
 Ta: 25°C

24V

Iout : 0%

Iout : 100%

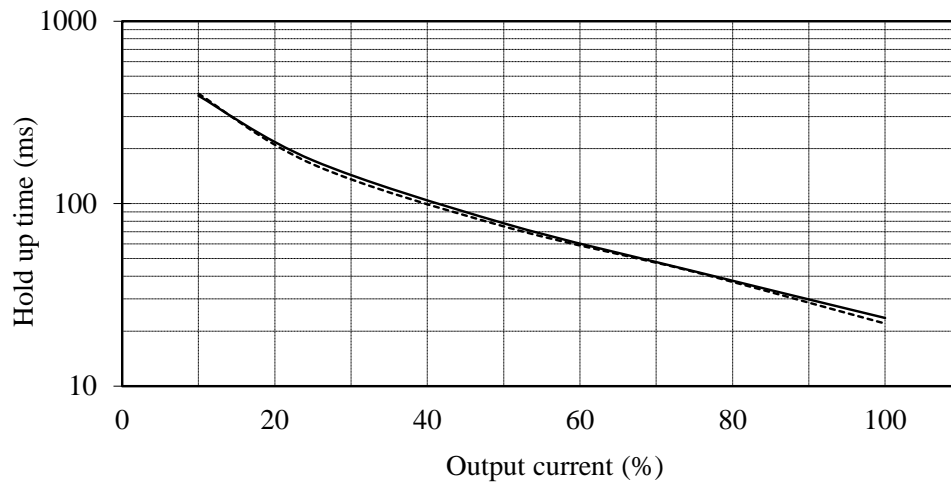


2.6 出力保持時間特性

Hold up time characteristics

Conditions Vin : 115VAC -----  
 230VAC ————  
 Ta : 25°C

24V



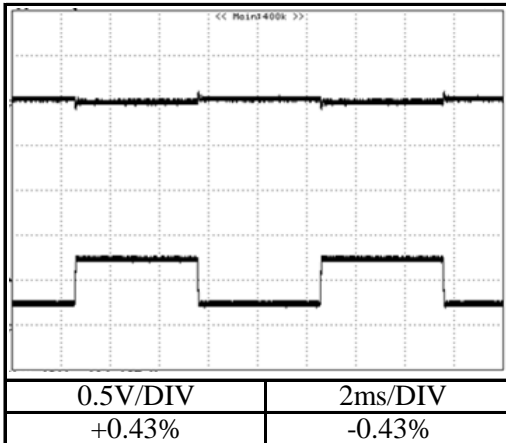
2.7 過渡応答（負荷急変）特性  
 Dynamic load response characteristics

Conditions Vin : 115VAC  
 Iout : 25% ↔ 75%  
 (tr = tf = 50us)  
 Ta : 25°C

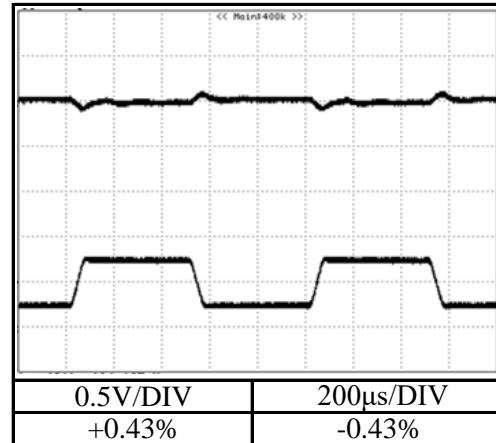
24V

f = 100Hz

f = 1kHz



← Vout →  
 ← Iout →  
 ← Iout:0% →



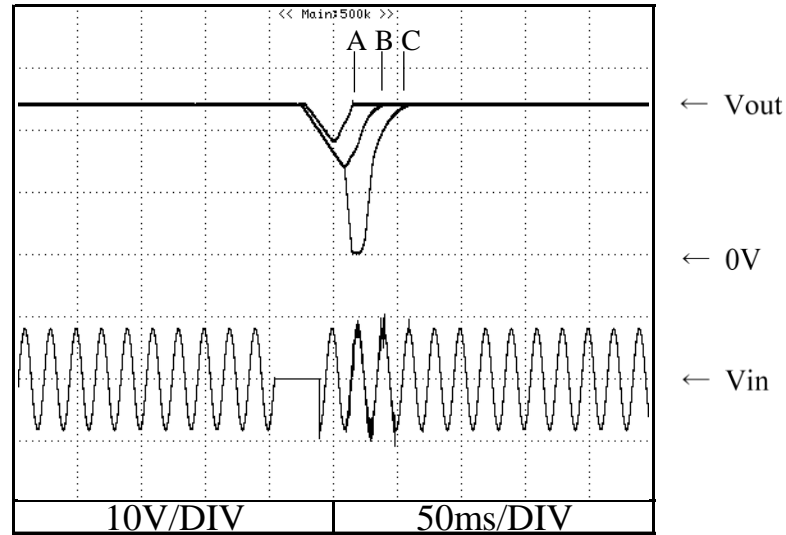
2.8 入力電圧瞬停特性

Response to brown out characteristics

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

24V

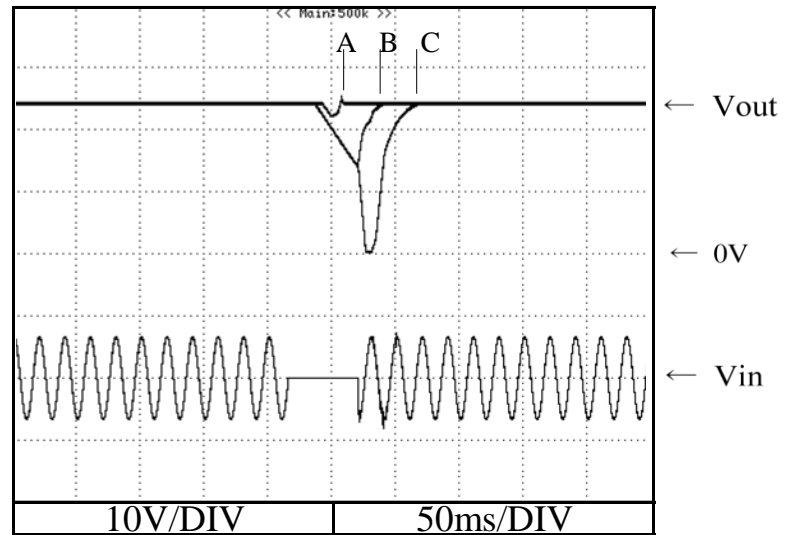
A = 23ms  
B = 34ms  
C = 35ms



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

24V

A = 27ms  
B = 54ms  
C = 55ms



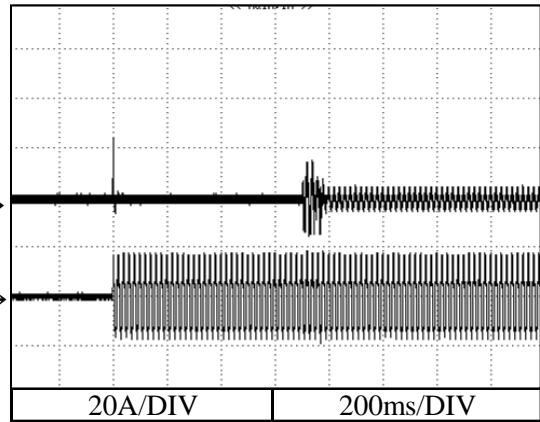
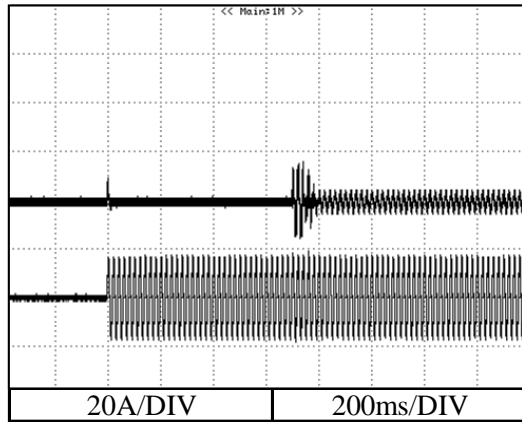
2.9 入力サージ電流（突入電流）波形  
Inrush current waveform

24V

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

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

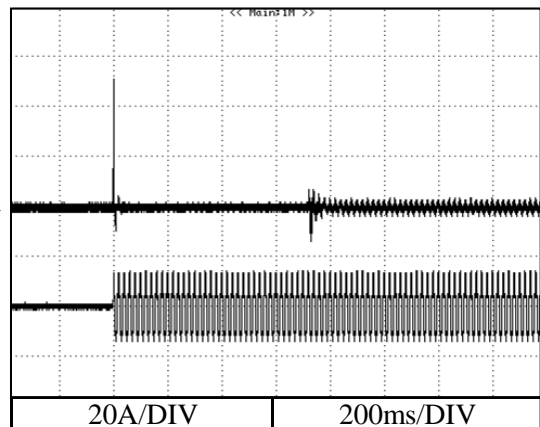
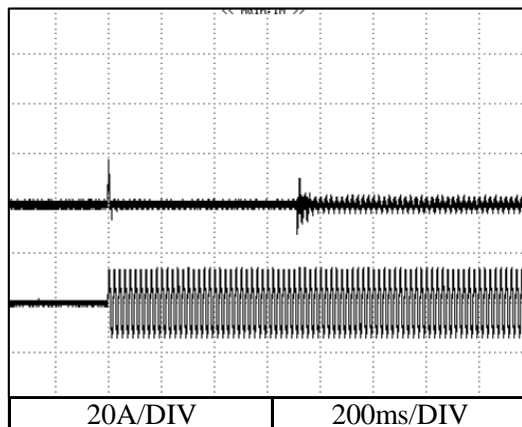
Switch on phase angle of input AC voltage  
 $\phi = 90^\circ$



Conditions Vin : 230VAC  
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 高調波成分

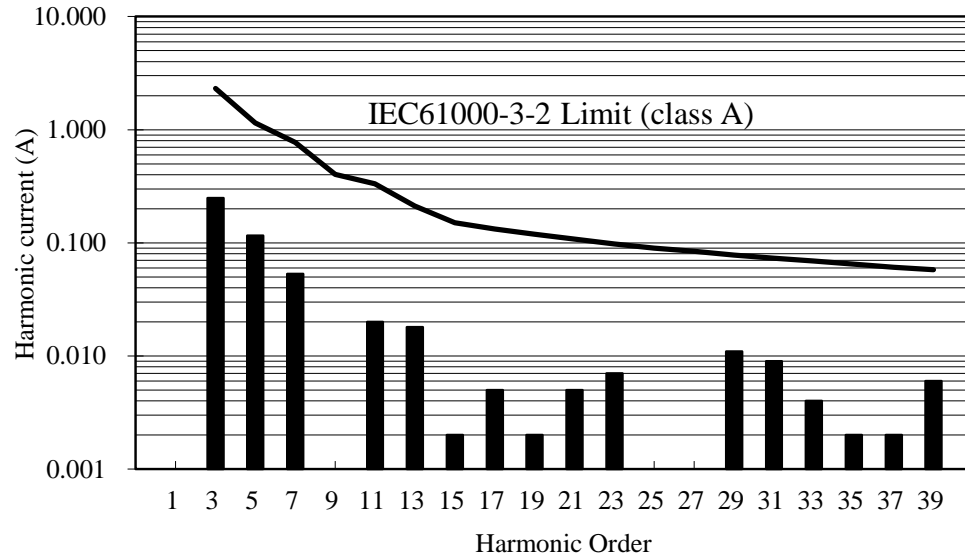
Input current harmonics

Conditions Iout : 100%

Ta : 25°C

24V

Vin : 115VAC

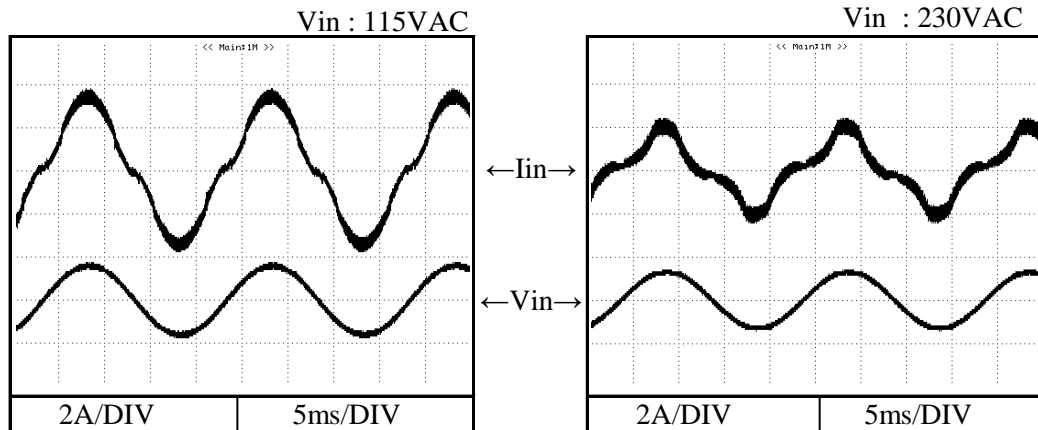


2.11 入力電流波形

Input current waveform

Conditions Iout : 100%

Ta : 25°C



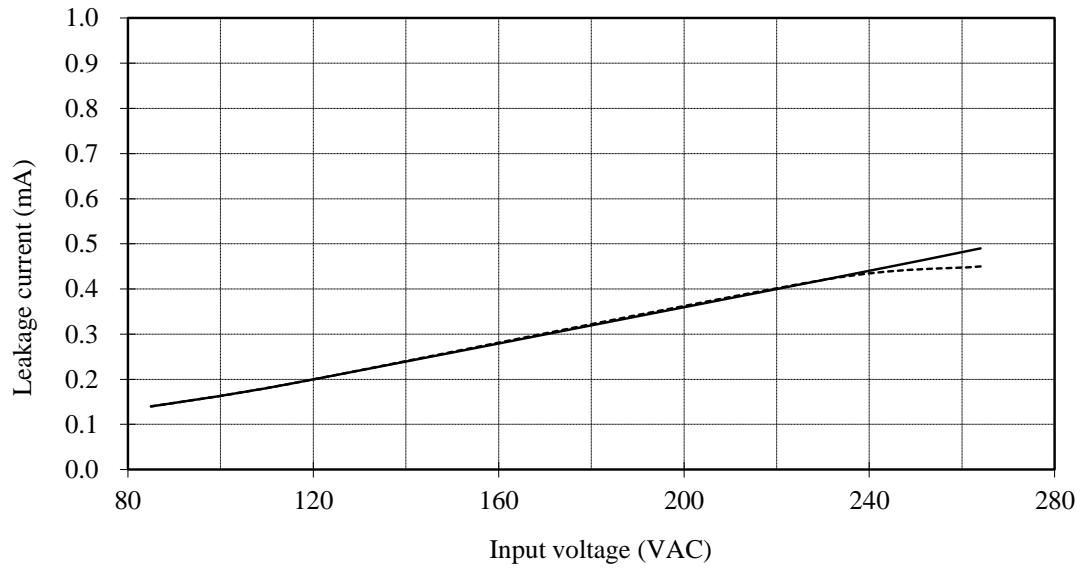
2.12 リーク電流特性

Leakage current characteristics

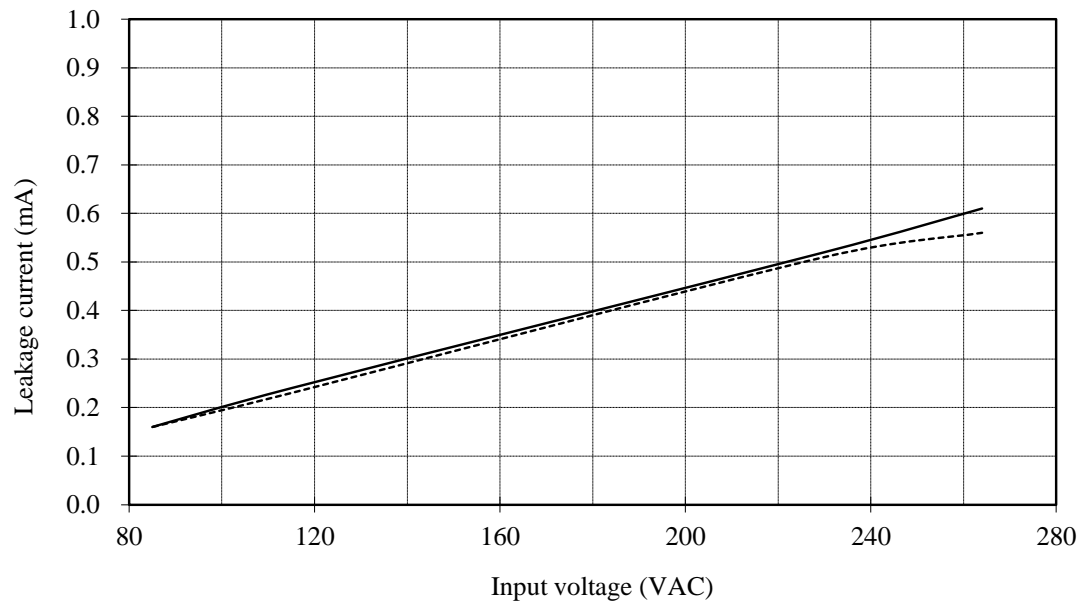
Conditions Iout : 0% -----  
 100% ———  
 Ta : 25°C

24V

f : 50Hz



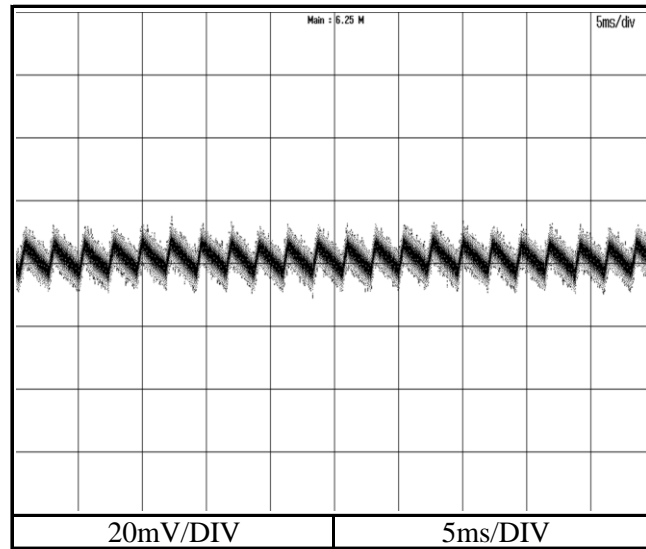
f : 60Hz



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

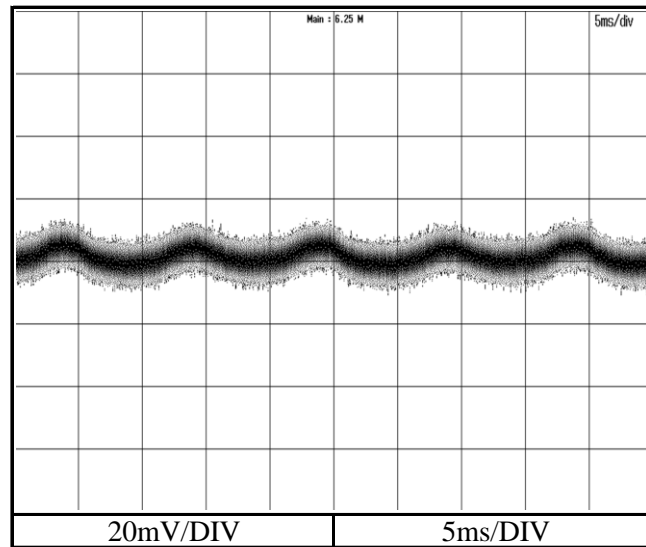
Conditions Vin : 115VAC  
Iout : 0%  
Ta : 25°C

24V



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

24V



2.14 EMI 特性

Electro-Magnetic Interference characteristics

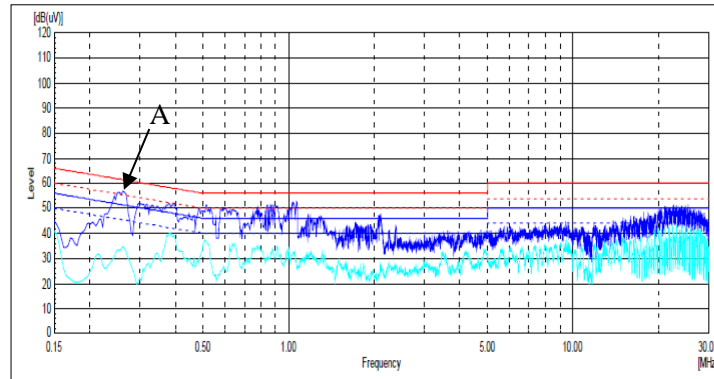
Conditions Vin : 230VAC  
Iout : 100%  
Ta : 25°C

雑音端子電圧  
Conducted Emission

24V

Phase : L

		Point A (0.26MHz)	
Ref. Data	Limit (dBuV)	Measure (dBuV)	
QP	61.5	54.8	
AV	51.5	41.5	

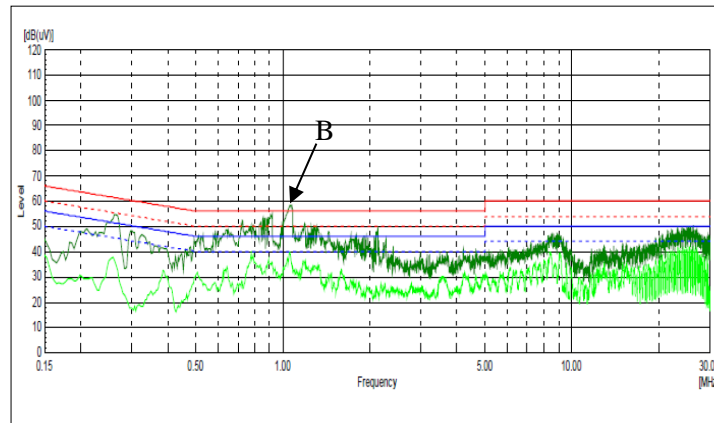


QP spectrum waveform : — (orange)  
AV spectrum waveform : — (blue)

EN55032-B  
QP Limit  
EN55032-B  
AV Limit

Phase : N

		Point B (1.17MHz)	
Ref. Data	Limit (dBuV)	Measure (dBuV)	
QP	56	49.2	
AV	46	32.6	



QP spectrum waveform : — (orange)  
AV spectrum waveform : — (blue)

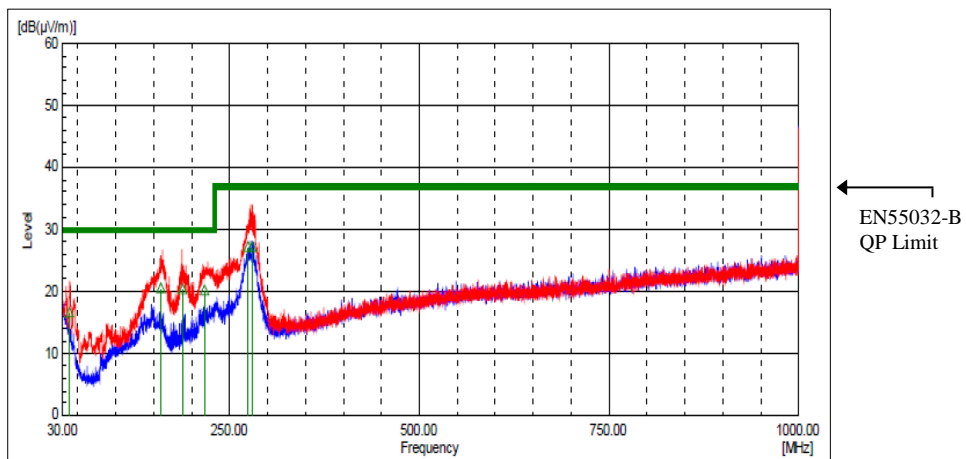
EN55032-B  
QP Limit  
EN55032-B  
AV Limit

EN55011B,EN55032B,FCCBの限界値はVCCI class Bの限界値と同じ  
Limit of EN55011B,EN55032B,FCCB are same as its VCCI class B.

雑音電界強度  
Radiated Emission

24V

Conditions Vin : 230VAC  
Iout : 100%  
Ta : 25°C  
Horizontal : — (orange)  
Vertical : — (blue)



EN55011B,EN55032Bの限界値はVCCI class Bの限界値と同じ  
Limit of EN55011B,EN55032B are same as its VCCI class B.  
表示はピーク値  
Indication is peak values.