

**EZA11K-320240**

**EVALUATION DATA**

型式データ

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### 使用記号 Terminology used

	定義	Definition
V <sub>in</sub> .....	入力電圧	Input voltage
V <sub>out</sub> .....	出力電圧	Output voltage
I <sub>in</sub> .....	入力電流	Input current
I <sub>o</sub> .....	出力電流	Output current
V <sub>grid</sub> .....	グリッド電圧	Grid voltage
V <sub>bat</sub> .....	バッテリー電圧	Battery voltage
I <sub>grid</sub> .....	グリッド電流	Grid current
I <sub>bat</sub> .....	バッテリー電流	Battery current
T <sub>a</sub> .....	周囲温度	Ambient temperature

※ 特記無き特性は、他律CVモードのデータです。

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。

Otherwise stated characteristics are data of manual CV mode.

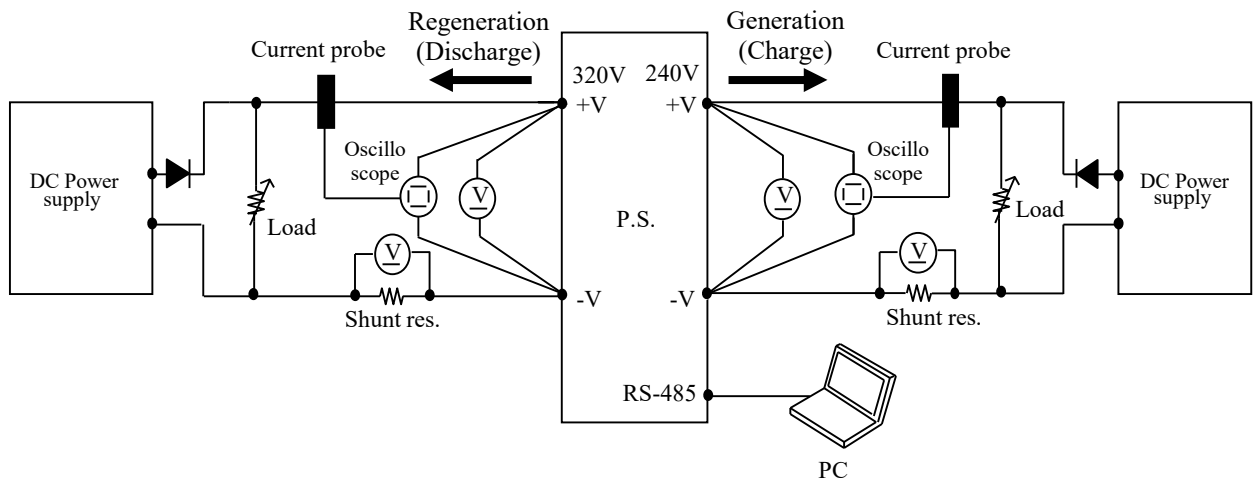
The results are reference data based on our measurement condition.

# 1. 測定方法 Evaluation Method

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

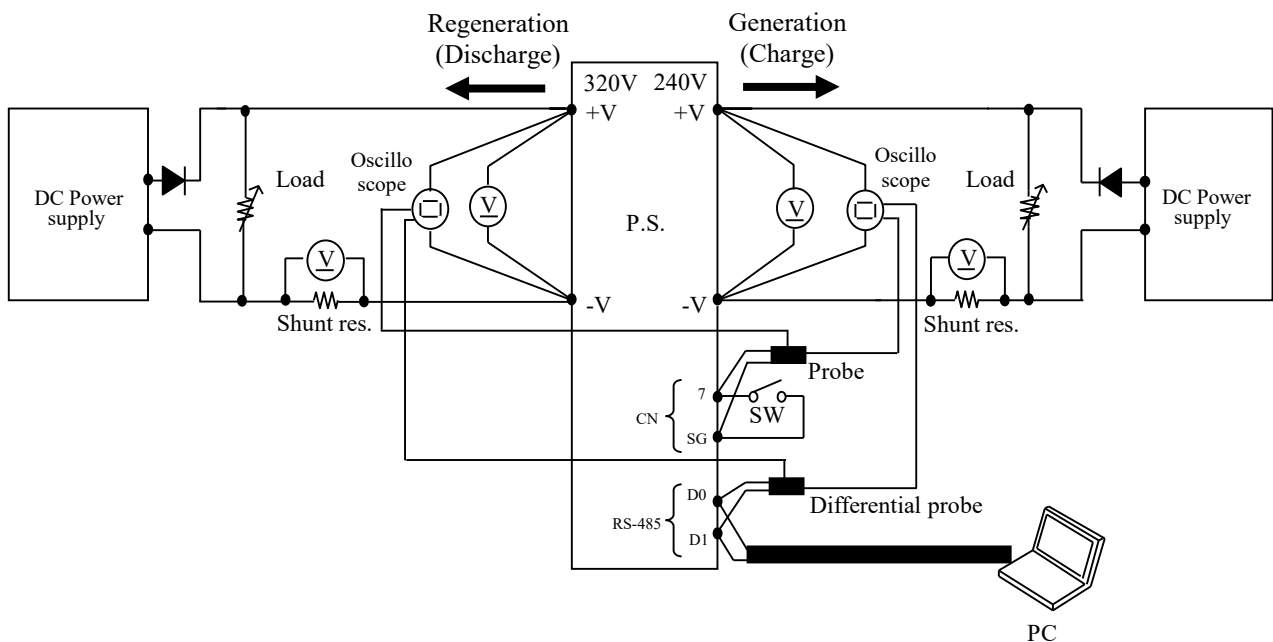
### 測定回路1 Circuit 1 used for determination

- 静特性 Steady state characteristics
- 無負荷、待機電力特性 No load and standby power characteristics
- 通電ドリフト特性 Warm up voltage drift characteristics
- 定電流特性 Constant current characteristics
- 過電圧保護特性 Over voltage protection (OVP) characteristics
- 0Vランプアップ起動特性 0V ramp up characteristics
- 力行・回生切換え特性 Generation and regeneration switching characteristics
- 定電流指令応答特性 Constant current command response characteristics
- バッテリ保護特性 Battery protection characteristics



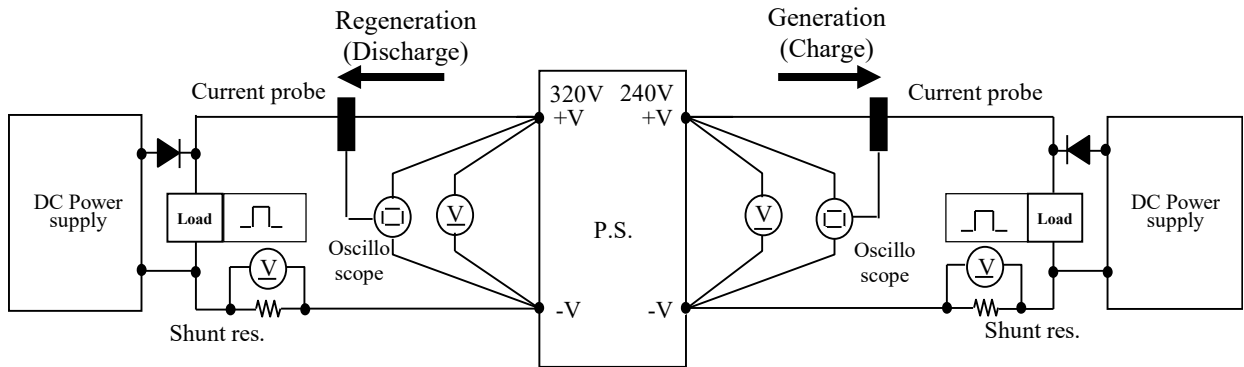
### 測定回路2 Circuit 2 used for determination

- 出力立ち上がり、立ち下り特性 Output rise & fall characteristics
- 出力電圧指令応答特性(外部出力端子 / RS-485) Output voltage command response characteristics (External terminal / RS-485)

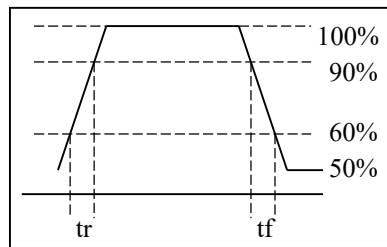


測定回路3 Circuit 3 used for determination

- 負荷急変特性 Dynamic load response characteristics

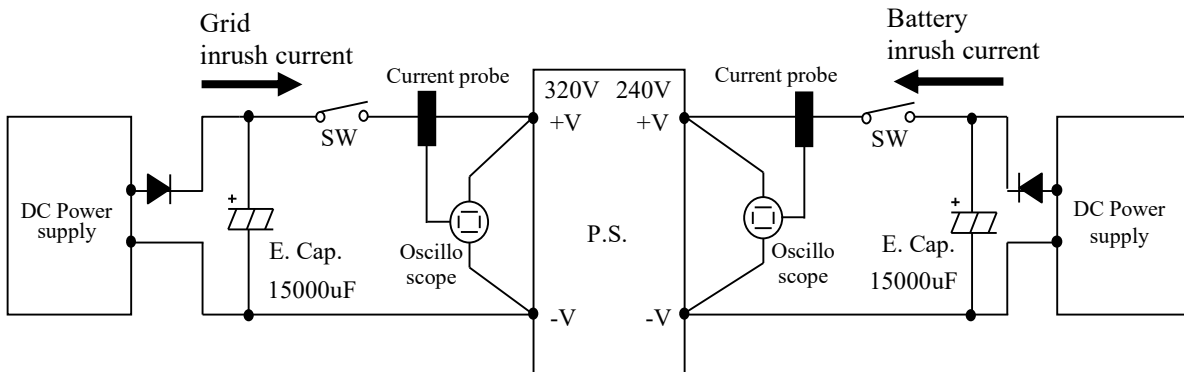


Output current waveform  
Iout 50% <=> 100%



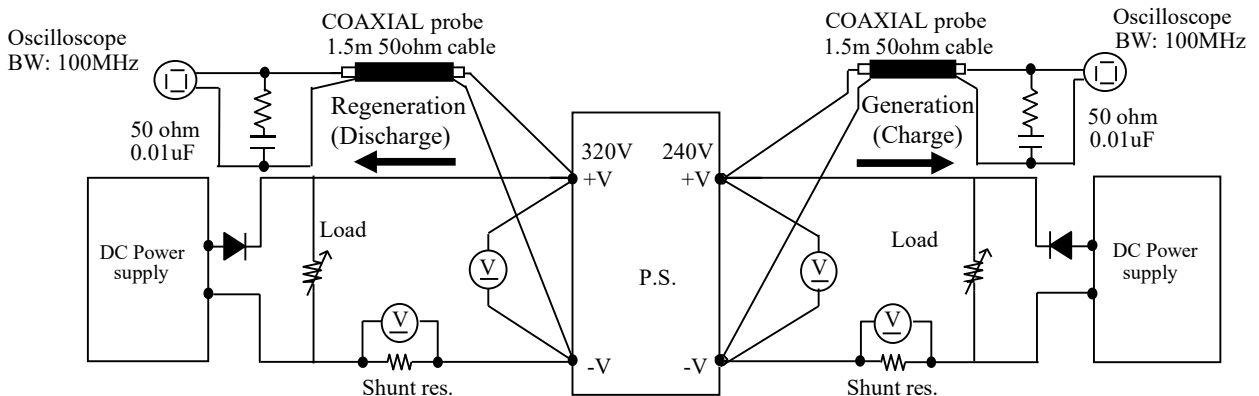
測定回路4 Circuit 4 used for determination

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



測定回路5 Circuit 5 used for determination

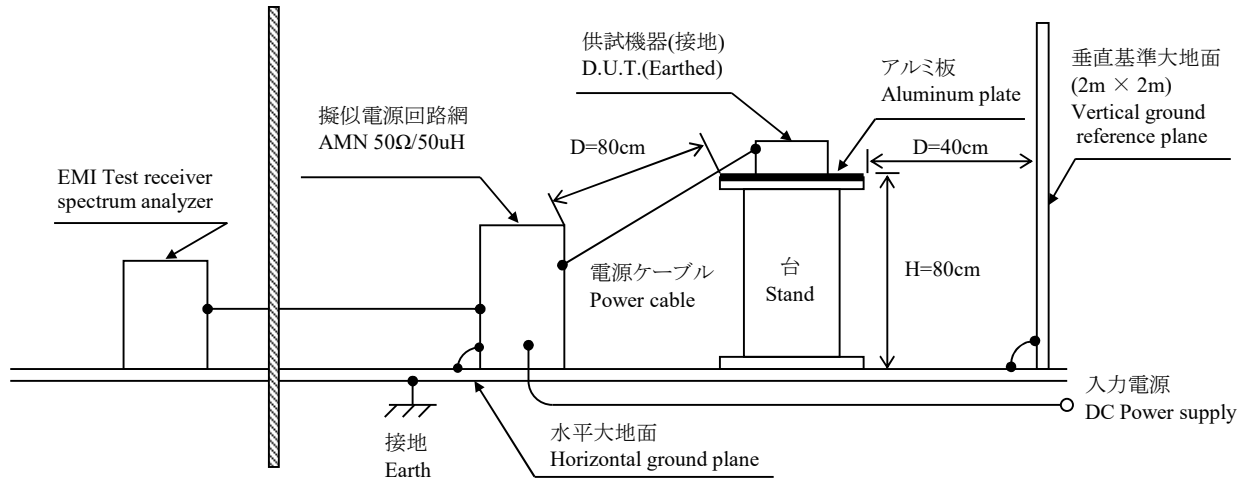
- 出力リップル・ノイズ波形 Output ripple and noise waveform



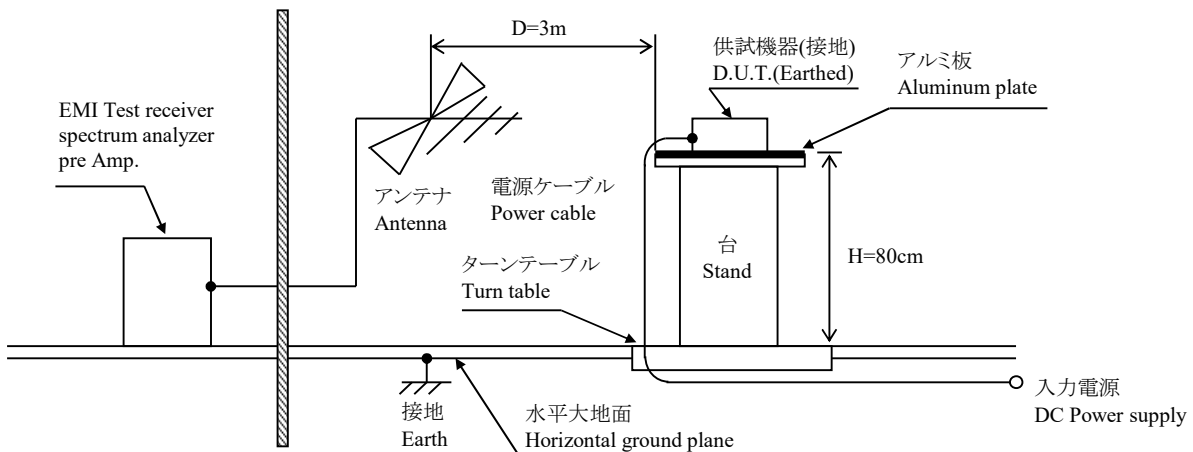
## 測定構成 Configuration used for determination

- EMI特性 Electro-Magnetic Interference characteristics

## (a) 雑音端子電圧(帰還ノイズ) Conducted Emission



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



## 1-2. 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DL9040L
2	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DLM4058
3	DIGITAL MULTIMETER	KEYSIGHT	34401A
4	DATA ACQUISITION / SWITCH UNIT	KEYSIGHT	34970A
5	CURRENT PROBE	YOKOGAWA ELECT.	701930
6	SHUNT RESISTER	YOKOGAWA ELECT.	2215
7	CONTROLLED TEMP. CHAMBER	ESPEC CORP.	PL-4J
8	SPECTRUM ANALYZER / EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCI
9	PRE AMP	SONOMA	310N
10	RF RELAY MATRIX	ROHDE & SCHWARZ	PSU
11	AMN	KYORITU DENSHI	KNW-242
12	ANTENNA	SCHWARZBECK	CBL6111D
13	DYNAMIC DUMMY LOAD	KEISOKU GIKEN	34230
14	DYNAMIC DUMMY LOAD	KEISOKU GIKEN	34330
15	DYNAMIC DUMMY LOAD	KEISOKU GIKEN	34215
16	DYNAMIC DUMMY LOAD	CHROMA	63220E
17	DC POWER SUPPLY	KEYSIGHT	N8934A
18	DC POWER SUPPLY	KEYSIGHT	N8935A
19	AC・DC POWER SUPPLY	KIKUSUI	PCR12000WE2R
20	FEEDTHRU TERMINATION	KEISOKU GIKEN	TRC-50F2

## 2. 特性データ Characteristics

### 2-1. 静特性 Steady state characteristics

#### (1) 入力・負荷・温度変動 Regulation - line and load, Temperature drift

##### (a) 力行 Generation mode

$V_o=240\text{VDC}$

#### 1. Regulation - line and load

Condition  $T_a : 25^\circ\text{C}$

$I_{out} \setminus V_{in}$	240VDC	320VDC	400VDC	line regulation	
0%	239.653V	239.599V	239.573V	80mV	0.033%
50%	239.577V	239.566V	239.338V	239mV	0.100%
100%	239.465V	239.532V	239.179V	353mV	0.147%
Load regulation	188mV	68mV	394mV		
	0.078%	0.028%	0.164%		

#### 2. Temperature drift

Conditions  $V_{in}=320\text{VDC}$

$I_{out}=45.8\text{A}$

$T_a$	$-10^\circ\text{C}$	$+25^\circ\text{C}$	$+50^\circ\text{C}$	temperature stability	
$V_{out}$	240.160V	239.532V	238.899V	1261mV	0.525%

$V_o=150\text{VDC}$

#### 1. Regulation - line and load

Condition  $T_a : 25^\circ\text{C}$

$I_{out} \setminus V_{in}$	240VDC	330VDC	line regulation	
0%	150.571V	150.645V	73mV	0.049%
50%	150.633V	150.182V	451mV	0.301%
100%	150.659V	150.097V	563mV	0.375%
Load regulation	88mV	548mV		
	0.059%	0.365%		

$V_o=300\text{VDC}$

#### 1. Regulation - line and load

Condition  $T_a : 25^\circ\text{C}$

$I_{out} \setminus V_{in}$	290VDC	400VDC	line regulation	
0%	298.452V	298.365V	87mV	0.029%
50%	298.147V	298.485V	338mV	0.113%
100%	298.327V	298.648V	321mV	0.107%
Load regulation	305mV	283mV		
	0.102%	0.094%		



## 2-1. 静特性 Steady state characteristics

(1) 入力・負荷・温度変動 Regulation - line and load, Temperature drift

(b) 回生 Regeneration mode

**Vo=320VDC**

## 1. Regulation - line and load

Condition Ta : 25°C

Iout \ Vin	150VDC	240VDC	300VDC	line regulation	
0%	320.324V	320.123V	320.066V	257mV	0.080%
50%	319.623V	319.749V	319.674V	126mV	0.039%
100%	319.252V	319.692V	319.333V	440mV	0.137%
Load regulation	1072mV	432mV	733mV		
	0.335%	0.135%	0.229%		

## 2. Temperature drift

Conditions Vin=240VDC

Iout=34.4A

Ta	-10°C	+25°C	+50°C	temperature stability	
Vout	319.855V	319.692V	318.361V	1494mV	0.467%

**Vo=240VDC**

## 1. Regulation - line and load

Condition Ta : 25°C

Iout \ Vin	150VDC	270VDC	line regulation	
0%	240.619V	240.629V	10mV	0.004%
50%	240.169V	240.187V	18mV	0.008%
100%	239.870V	239.786V	83mV	0.035%
Load regulation	749mV	843mV		
	0.312%	0.351%		

**Vo=400VDC**

## 1. Regulation - line and load

Condition Ta : 25°C

Iout \ Vin	240VDC	300VDC	line regulation	
0%	399.279V	399.211V	68mV	0.017%
50%	399.007V	398.949V	58mV	0.015%
100%	398.413V	398.563V	150mV	0.038%
Load regulation	866mV	648mV		
	0.217%	0.162%		

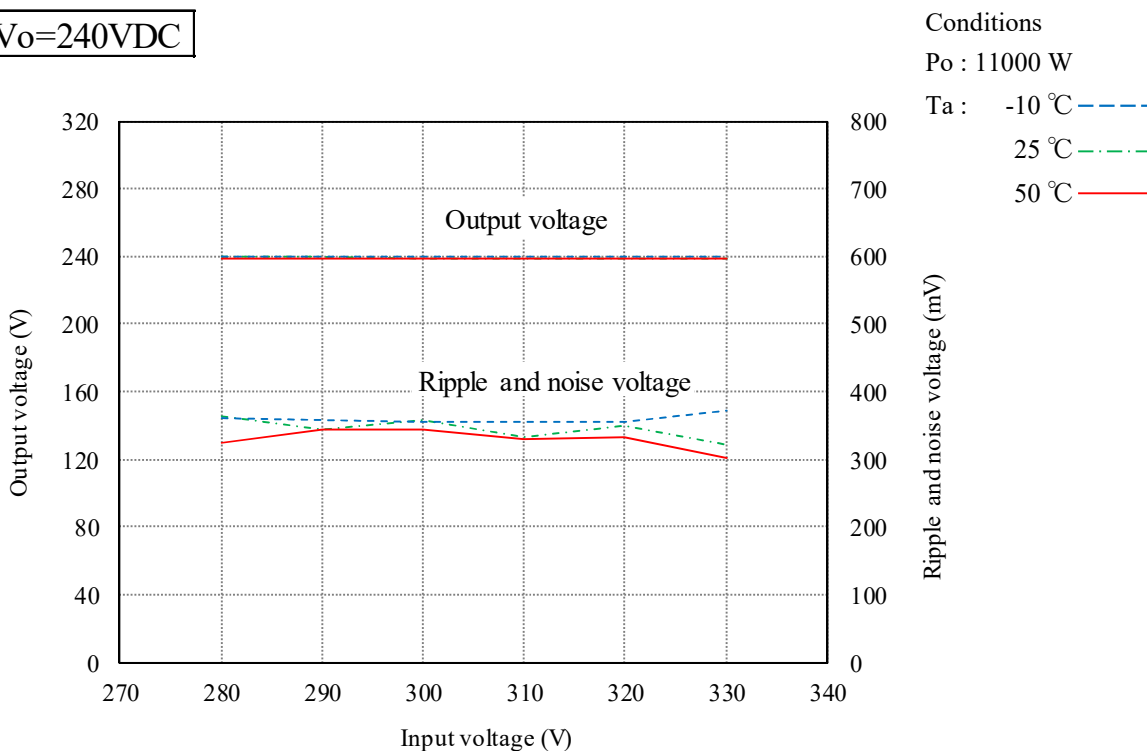
2-1. 静特性 Steady state characteristics

(2) 出力電圧・出力リップル 対 入力電圧

Output voltage and ripple vs. Input voltage

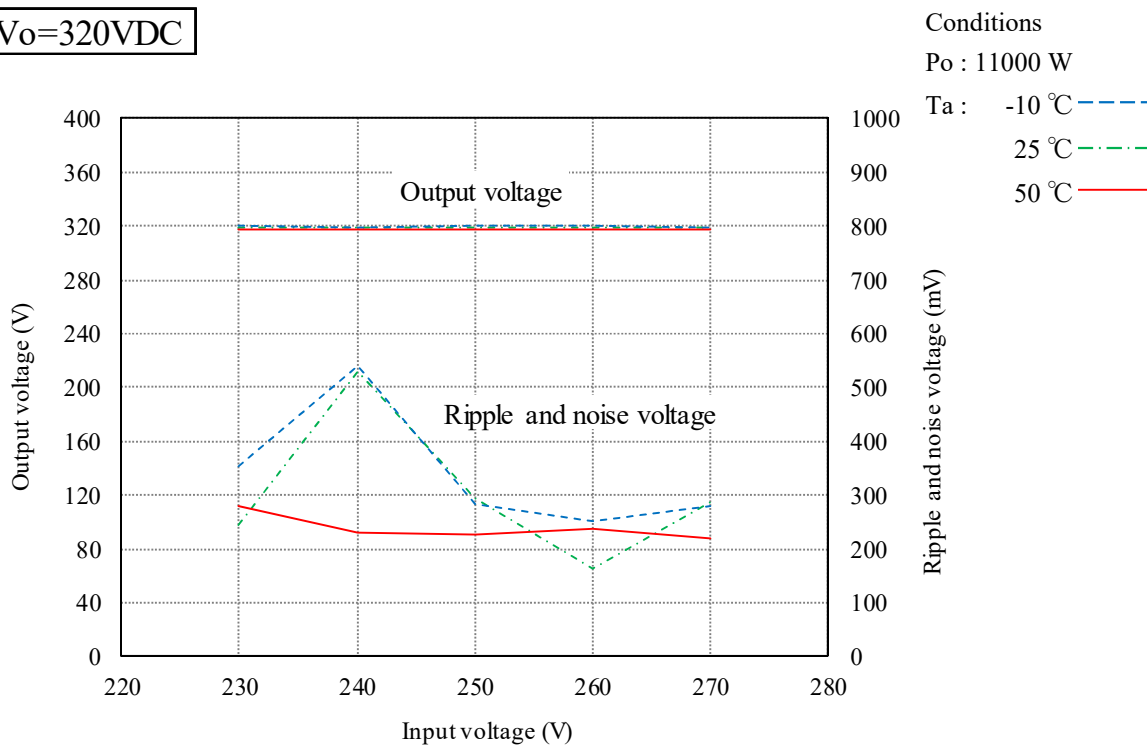
(a) 力行 Generation mode

$V_o=240VDC$



(b) 回生 Regeneration mode

$V_o=320VDC$



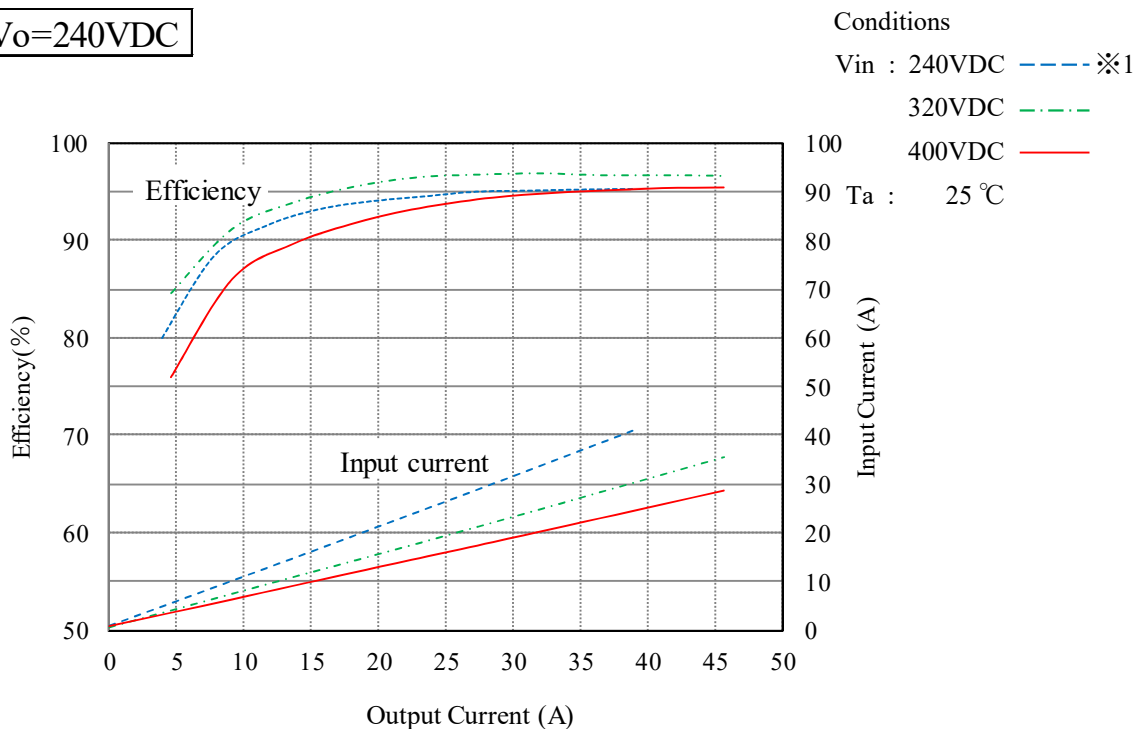
2-1. 静特性 Steady state characteristics

(3) 効率 対 出力電流、入力電流 対 出力電流

Efficiency vs. Output current and Input current vs. Output current

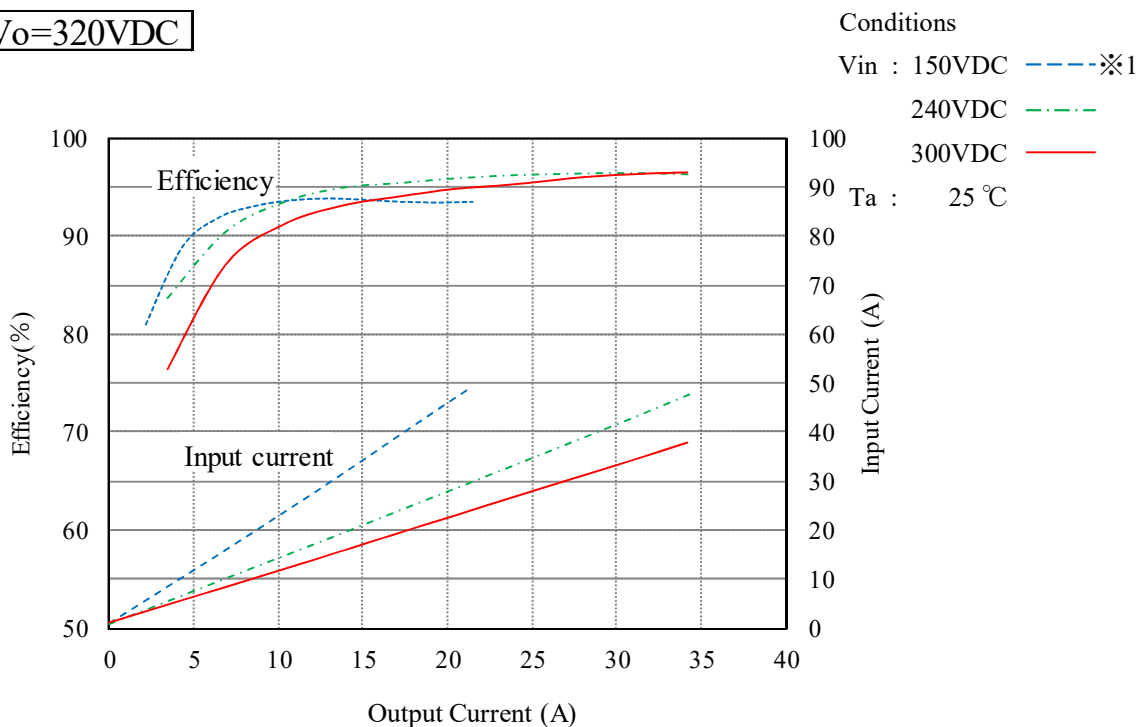
(a) 力行 Generation mode

$V_o=240VDC$



(b) 回生 Regeneration mode

$V_o=320VDC$



※1 最大入出力電流はグリッド電流では42A、バッテリー電流では52Aに制限されています。

The maximum input / output current is limited to 42A for the grid current and 52A for the battery current.

2-2. 無負荷、待機電力特性

No load and standby power characteristics

(a) 力行時、無負荷電力 Generation mode, No load

$V_o = 240\text{VDC}, I_o = 0\text{A}$

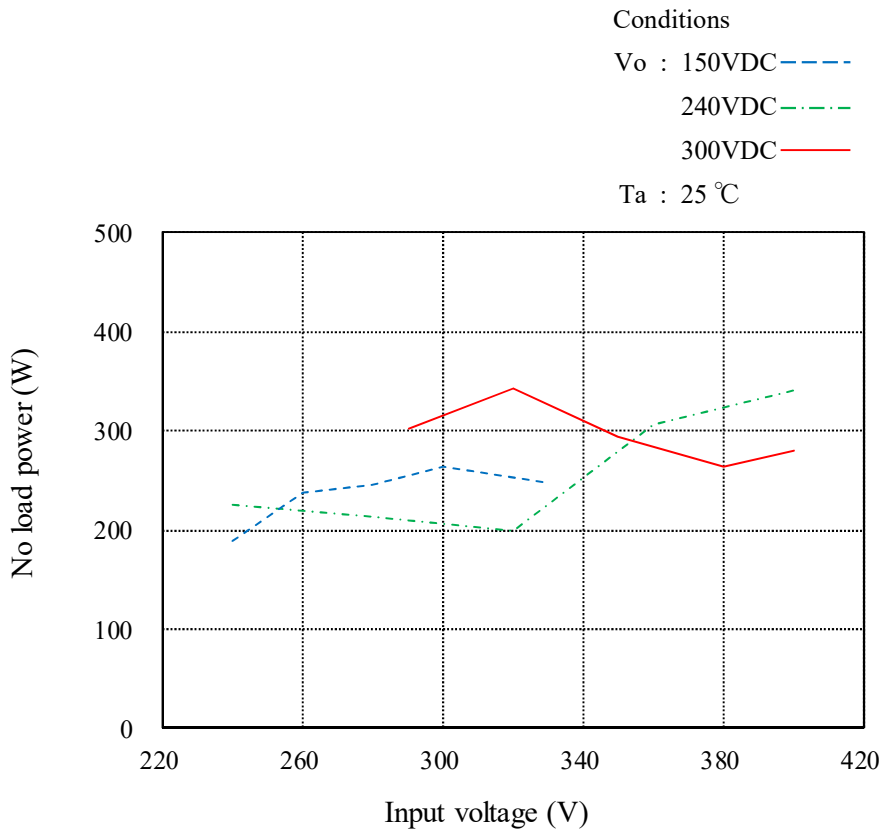
$V_{in}$ [V]	$I_{in}$ [A]	$P_{in}$ [W]
240	0.94	225.28
280	0.76	213.90
320	0.62	199.65
360	0.85	305.57
400	0.85	341.00

$V_o = 150\text{VDC}, I_o = 0\text{A}$

$V_{in}$ [V]	$I_{in}$ [A]	$P_{in}$ [W]
240	0.79	189.54
260	0.92	238.41
280	0.88	245.08
300	0.88	263.50
330	0.75	247.80

$V_o = 300\text{VDC}, I_o = 0\text{A}$

$V_{in}$ [V]	$I_{in}$ [A]	$P_{in}$ [W]
290	1.04	302.25
320	1.07	343.17
350	0.84	294.42
380	0.70	264.80
400	0.70	280.74



2-2. 無負荷、待機電力特性

No load and standby power characteristics

(b) 回生時、無負荷電力 Regeneration mode, No load

$V_o = 320\text{VDC}, I_o = 0\text{A}$

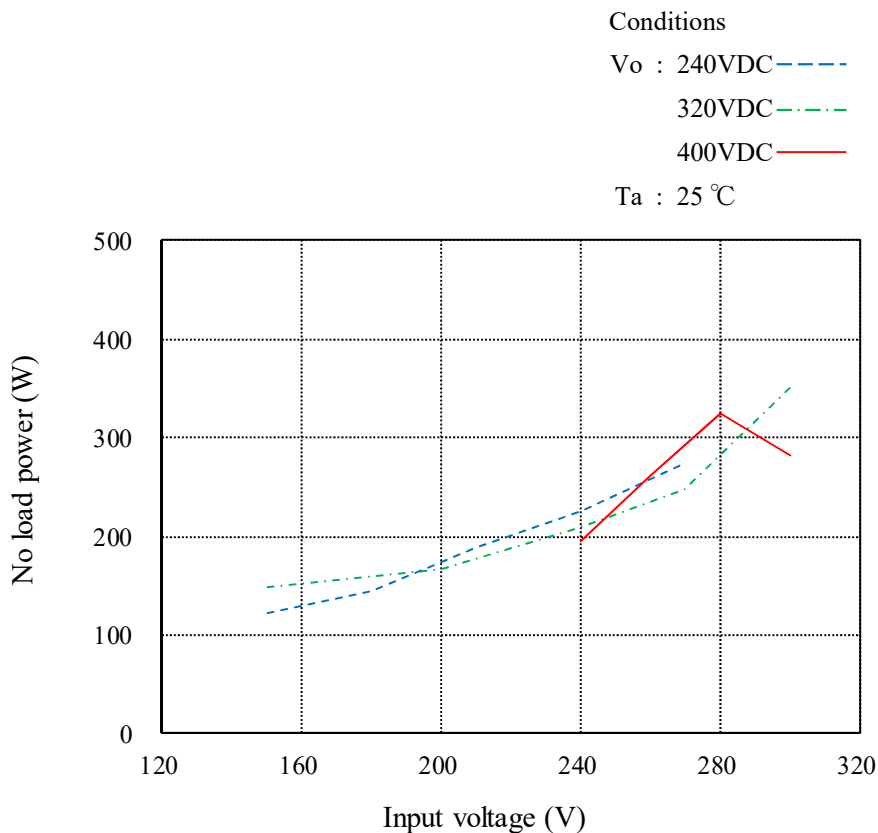
$V_{in}$ [V]	$I_{in}$ [A]	$P_{in}$ [W]
150	0.99	148.65
200	0.84	167.63
240	0.87	208.51
270	0.92	247.94
300	1.17	350.12

$V_o = 240\text{VDC}, I_o = 0\text{A}$

$V_{in}$ [V]	$I_{in}$ [A]	$P_{in}$ [W]
150	0.82	122.40
180	0.81	145.13
210	0.90	189.24
240	0.94	225.86
270	1.02	274.08

$V_o = 400\text{VDC}, I_o = 0\text{A}$

$V_{in}$ [V]	$I_{in}$ [A]	$P_{in}$ [W]
240	0.81	194.96
260	1.01	262.68
280	1.16	324.28
300	0.94	282.32



## 2-2. 無負荷、待機電力特性

No load and standby power characteristics

## (c) 待機電力 Standby power

Vbat = 150VDC

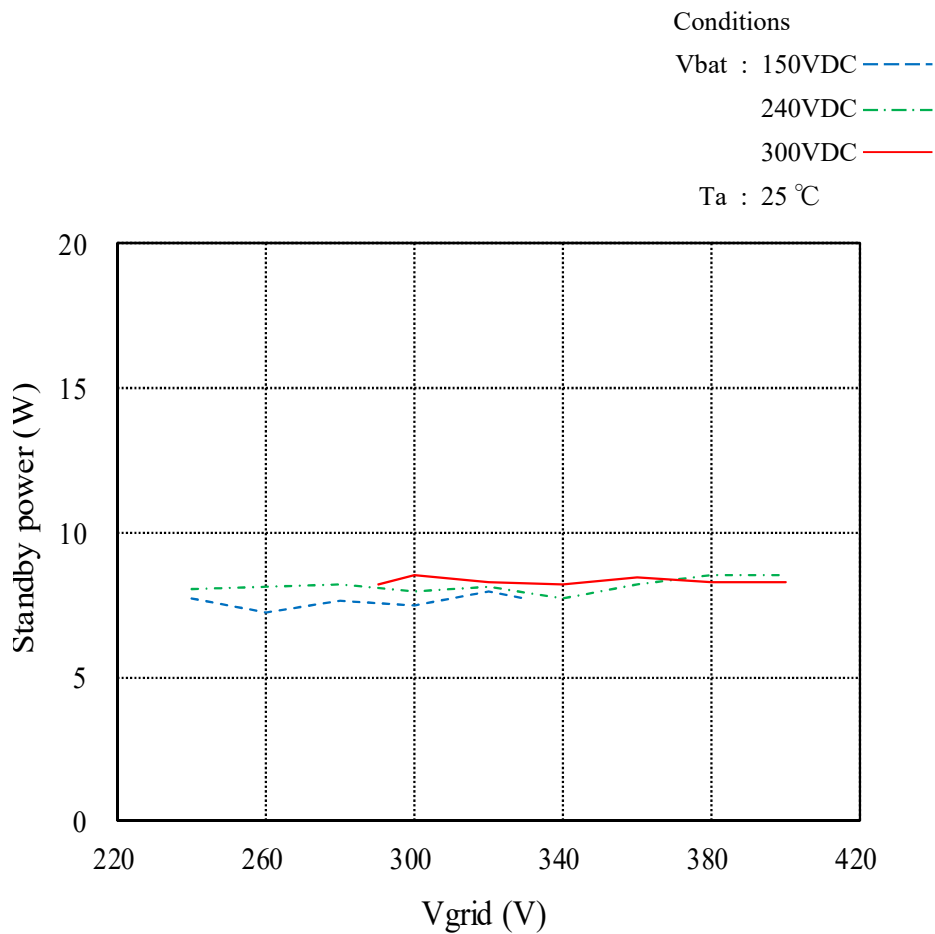
Vgrid [V]	P [W]
240	7.70
260	7.21
280	7.67
300	7.50
320	7.96
330	7.75

Vbat = 240VDC

Vgrid [V]	P [W]
240	8.02
260	8.14
280	8.24
300	7.94
320	8.16
340	7.70
360	8.20
380	8.56
400	8.57

Vbat = 300VDC

Vgrid [V]	P [W]
290	8.21
300	8.53
320	8.30
340	8.17
360	8.42
380	8.28
400	8.32



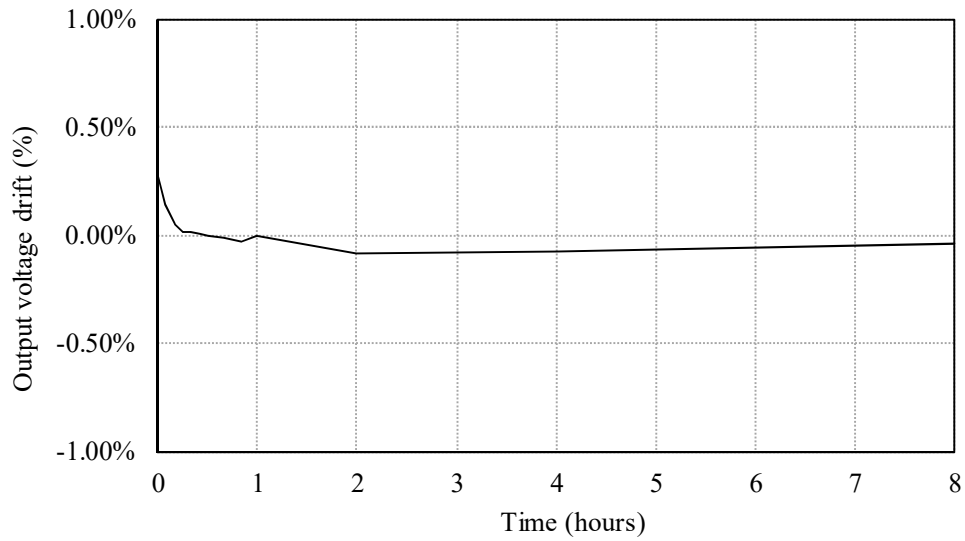
2-3. 通電ドリフト特性

Warm up voltage drift characteristics

(a) 力行 Generation mode

$V_o=240\text{VDC}$

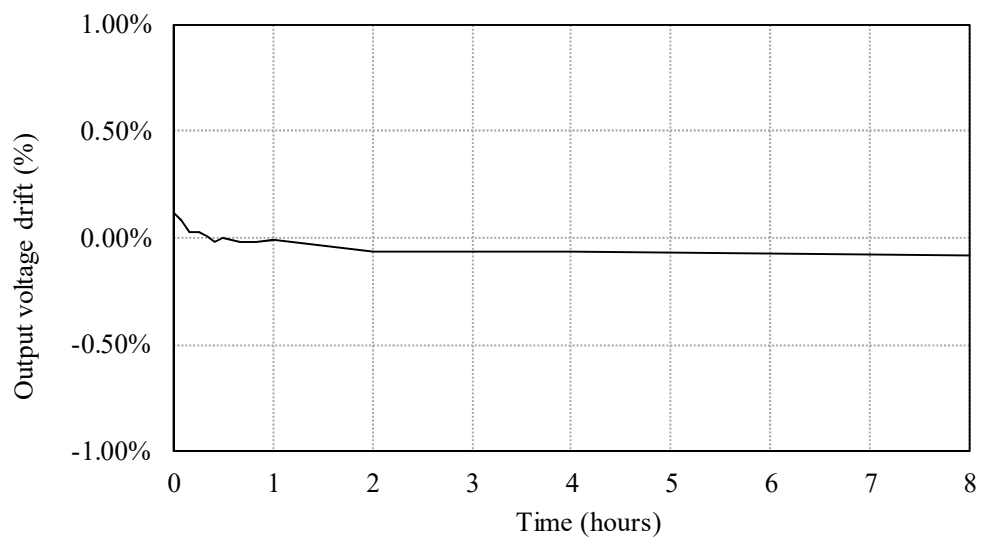
Condition  
 $V_{in} : 320\text{VDC}$   
 $I_o : 45.8\text{A}$   
 $T_a : 25^\circ\text{C}$



(b) 回生 Regeneration mode

$V_o=320\text{VDC}$

Condition  
 $V_{in} : 240\text{VDC}$   
 $I_o : 34.4\text{A}$   
 $T_a : 25^\circ\text{C}$

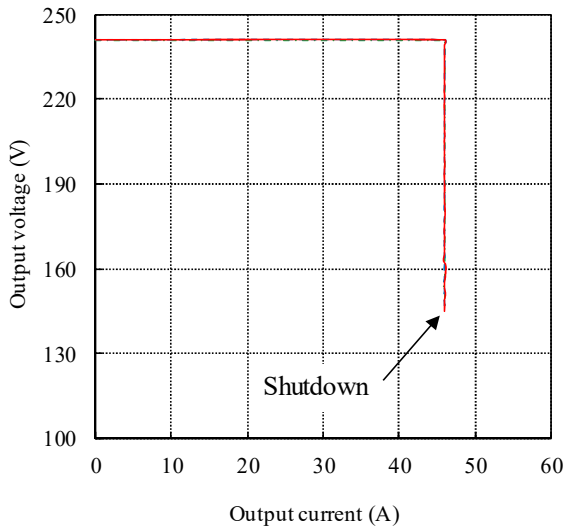


2-4. 定電流特性 Constant current characteristics

(a) 力行 Generation mode

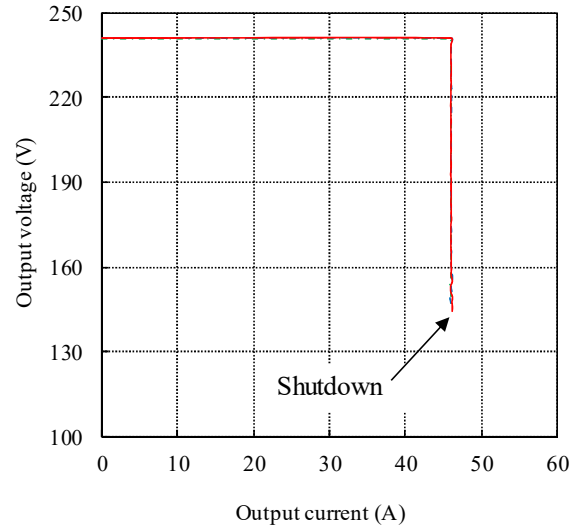
Conditions  
 Vin : 280 VDC ---  
 320 VDC - - -  
 330 VDC ———  
 Ta : 25 °C

Constant current value 45.8 A  
 Low voltage protection value 144 V



Conditions  
 Vin : 320 VDC  
 Ta : -10 °C ---  
 25 °C - - -  
 50 °C ———

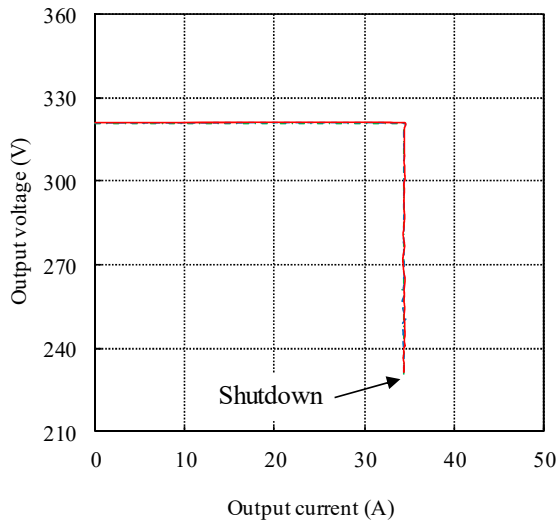
Constant current value 45.8 A  
 Low voltage protection value 144 V



(b) 回生 Regeneration mode

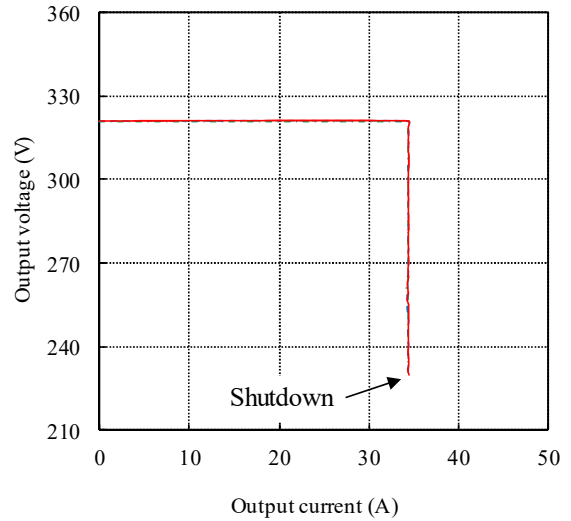
Conditions  
 Vin : 230 VDC ---  
 240 VDC - - -  
 270 VDC ———  
 Ta : 25 °C

Constant current value 34.4 A  
 Low voltage protection value 230 V



Conditions  
 Vin : 240 VDC  
 Ta : -10 °C ---  
 25 °C - - -  
 50 °C ———

Constant current value 34.4 A  
 Low voltage protection value 230 V





2-5. 過電圧保護特性

Over voltage protection (OVP) characteristics

(a) 力行 Generation mode

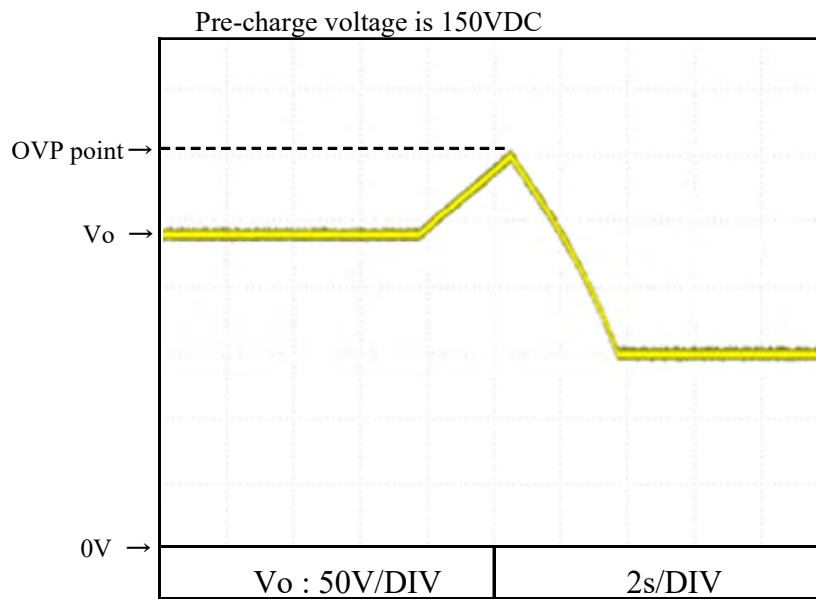
Condition

Vin : 320VDC

Io : 0A

Ta : 25°C

Over voltage protection value : 300VDC



(b) 回生 Regeneration mode

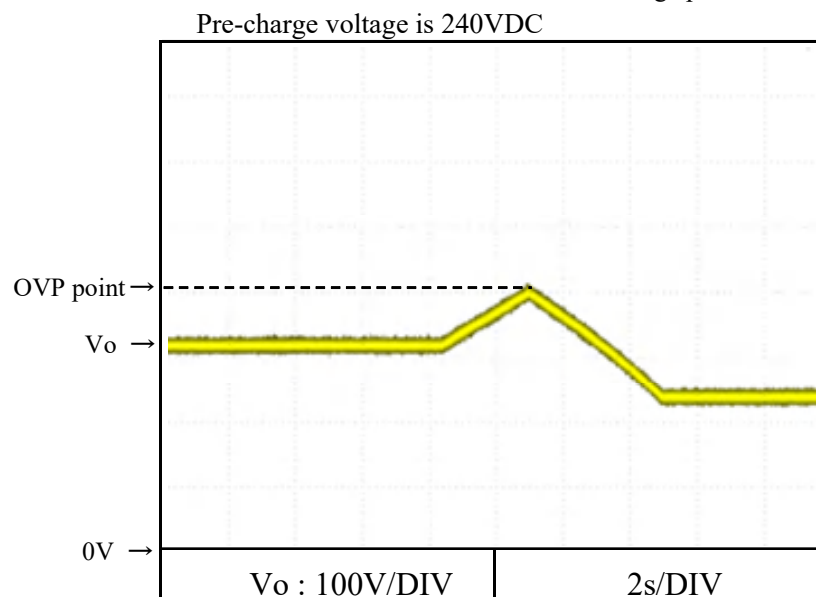
Condition

Vin : 240VDC

Io : 0A

Ta : 25°C

Over voltage protection value : 400VDC



2-6. 出力立ち上がり、立ち下がり特性  
Output rise and fall characteristics

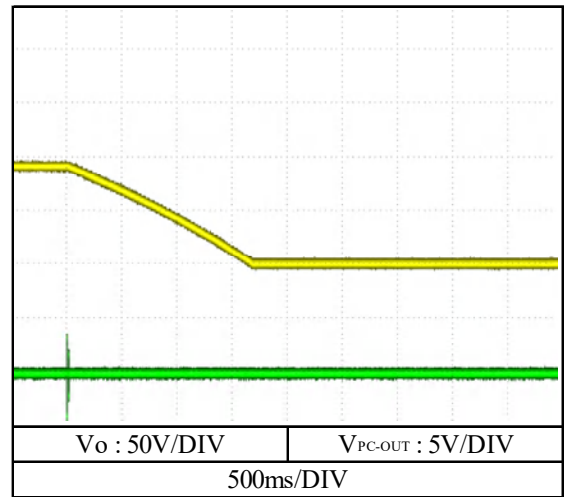
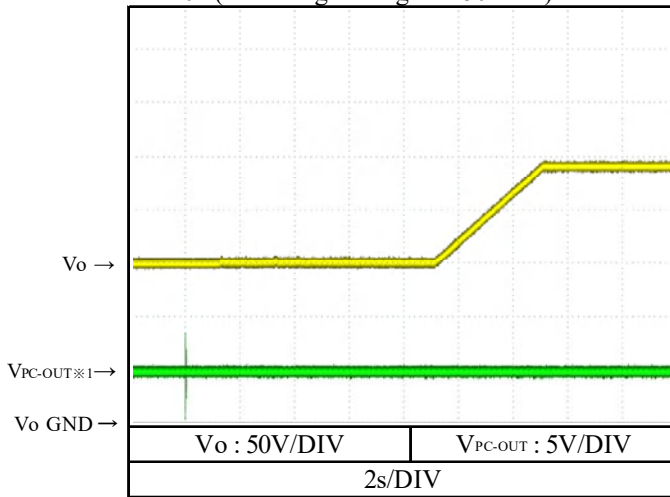
(a) 力行 Generation mode

(a-1) RS-485通信によるON/OFF  
ON/OFF control by RS-485

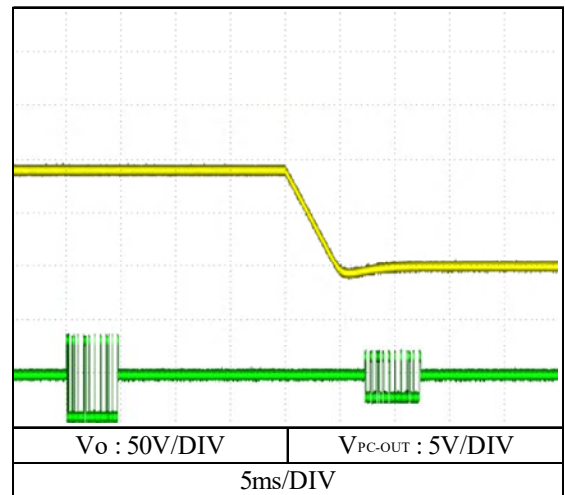
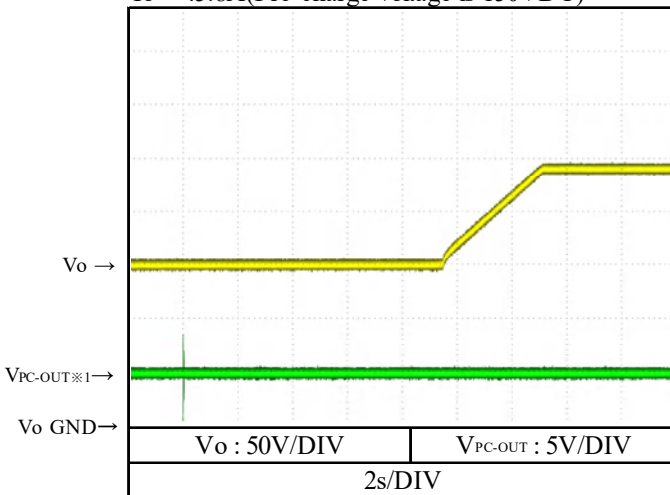
Condition  
Vin : 320VDC  
Ta : 25°C

$V_o = 240\text{VDC}$

$I_o = 0\text{A}$  (Pre-charge voltage is 150VDC)



$I_o = 45.8\text{A}$  (Pre-charge voltage is 150VDC)



※2 半2重通信方式のため、送信信号に対し応答信号が現れます。

By half-duplex communication system, response signal and transmitted signal are output.

2-6. 出力立ち上がり、立ち下がり特性  
Output rise and fall characteristics

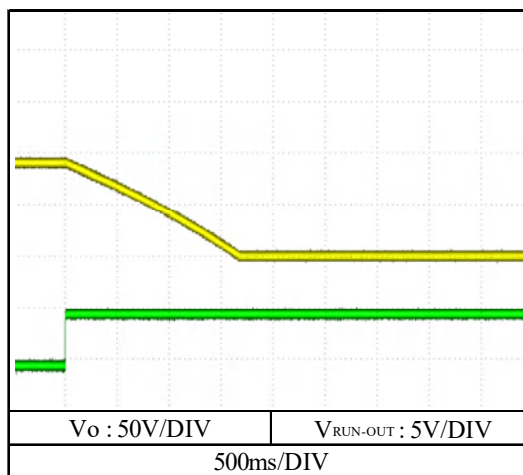
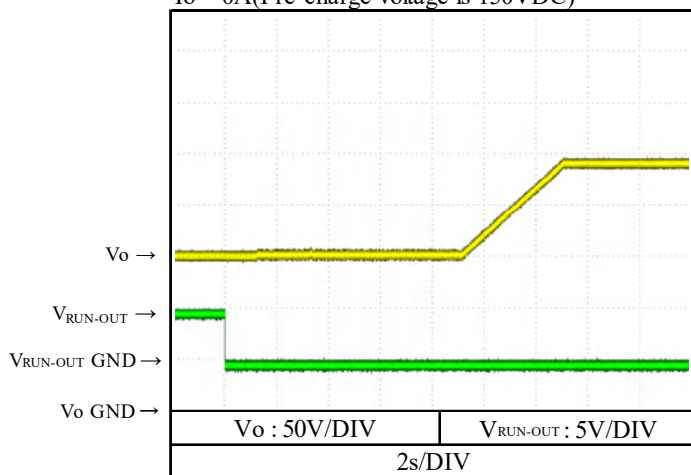
(a) 力行 Generation mode

(a-2) 外部RUN信号によるON/OFF  
ON/OFF control by external terminal

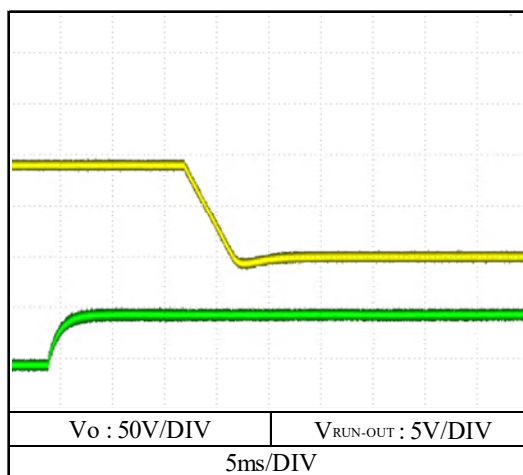
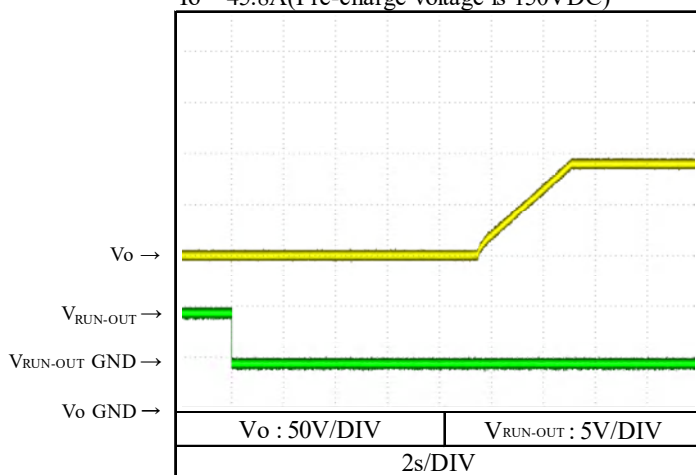
Condition  
 $V_{in}$  : 320VDC  
 $T_a$  : 25°C

$V_o=240VDC$

$I_o = 0A$ (Pre-charge voltage is 150VDC)



$I_o = 45.8A$ (Pre-charge voltage is 150VDC)



2-6. 出力立ち上がり、立ち下がり特性  
Output rise and fall characteristics

(b) 回生 Regeneration mode

(b-1) RS-485通信によるON/OFF  
ON/OFF control by RS-485

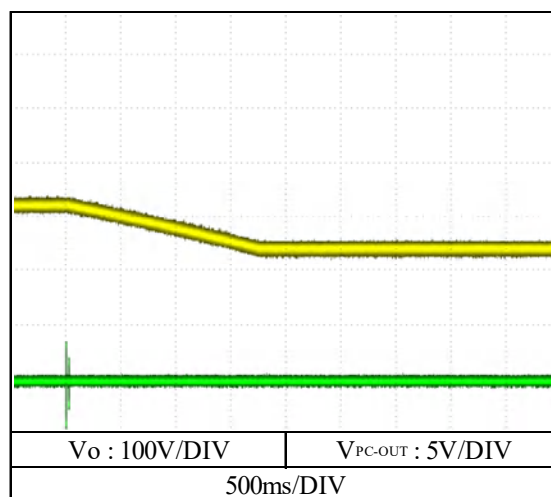
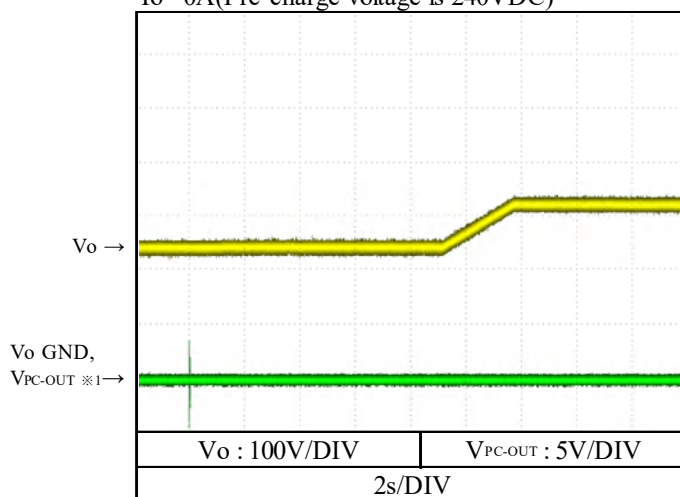
Condition

$V_{in}$  : 240VDC

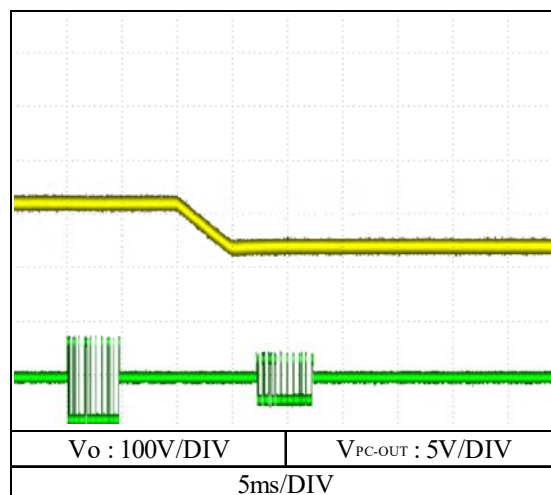
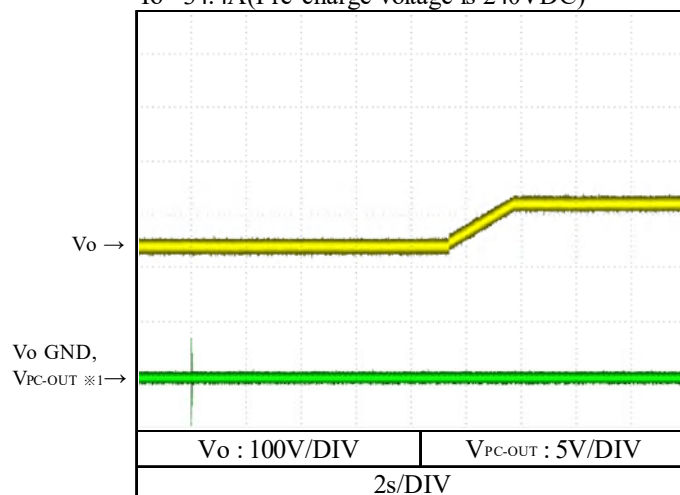
$T_a$  : 25°C

$V_o=320VDC$

$I_o=0A$ (Pre-charge voltage is 240VDC)



$I_o=34.4A$ (Pre-charge voltage is 240VDC)



※2 半2重通信方式のため、送信信号に対し応答信号が現れます。

By half-duplex communication system, response signal and transmitted signal are output.

2-6. 出力立ち上がり、立ち下がり特性  
Output rise and fall characteristics

(b) 回生 Regeneration mode

(b-2) 外部RUN信号によるON/OFF

ON/OFF control by external terminal

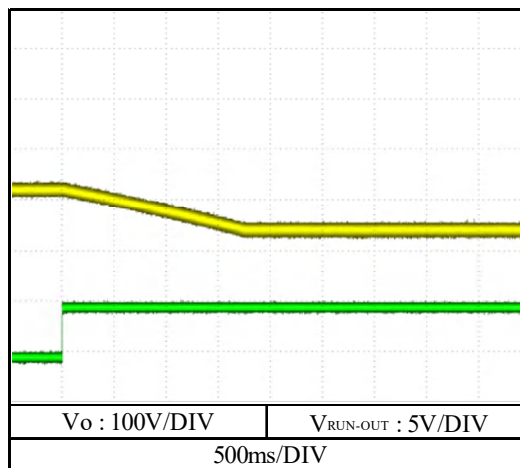
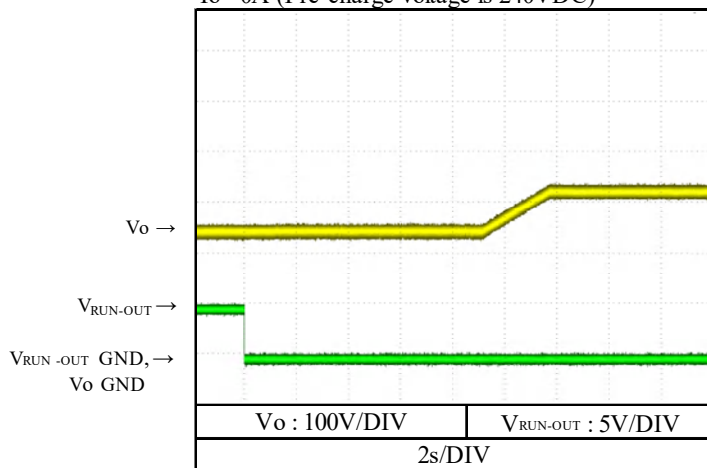
Condition

$V_{in}$  : 240VDC

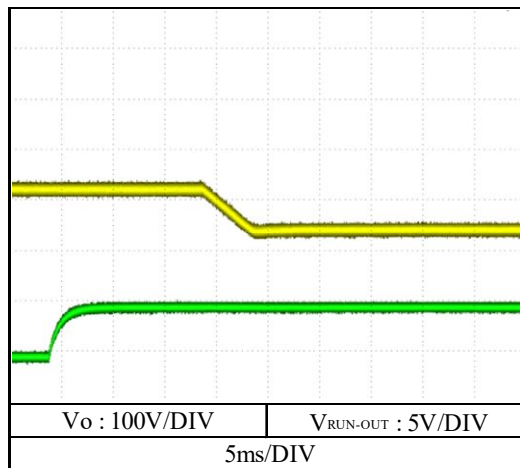
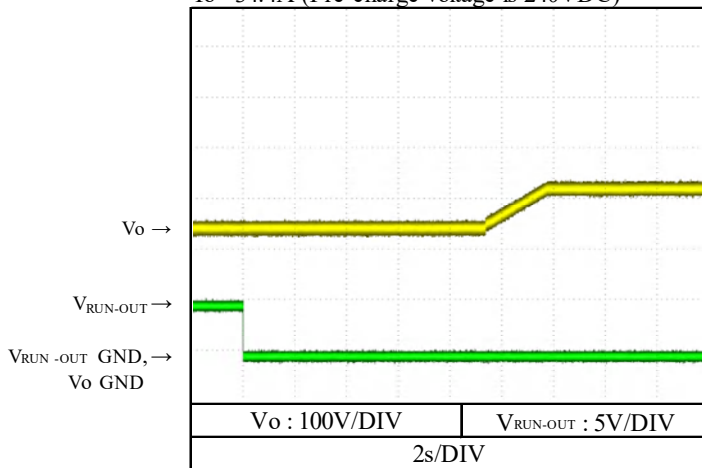
$T_a$  : 25°C

$V_o=320VDC$

$I_o=0A$  (Pre-charge voltage is 240VDC)



$I_o=34.4A$  (Pre-charge voltage is 240VDC)

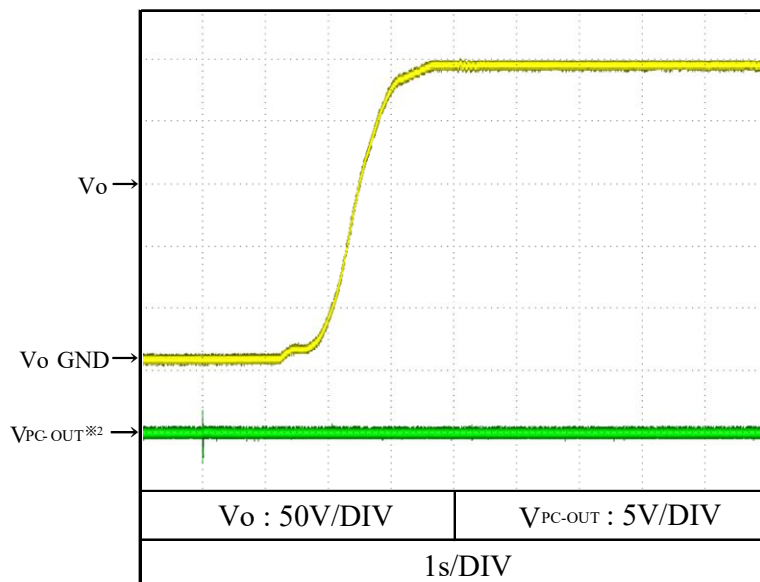


2-7. 0Vランプアップ起動特性  
0V ramp up characteristics

(a) 力行 Generation mode

(a-1) RS-485通信によるON/OFF  
ON/OFF control by RS-485

$V_o=240\text{VDC}$



Condition

$V_{in} : 320\text{VDC}$

$I_o : 0\text{A}$

$T_a : 25^\circ\text{C}$

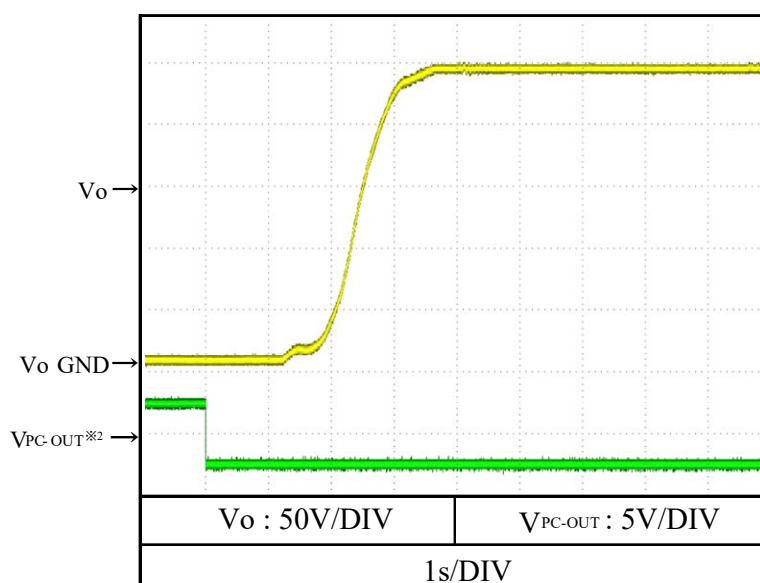
※2 半2重通信方式のため、送信信号に対し応答信号が現れます。

By half-duplex communication system, response signal and transmitted signal are output.

(a-2) 外部RUN信号によるON/OFF

ON/OFF control by external terminal

$V_o=240\text{VDC}$



Condition

$V_{in} : 320\text{VDC}$

$I_o : 0\text{A}$

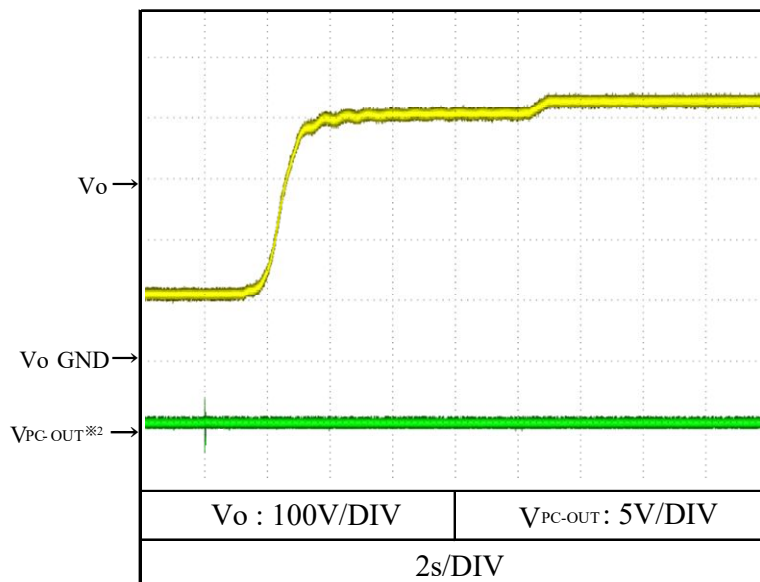
$T_a : 25^\circ\text{C}$

2-7. 0Vランプアップ起動特性  
0V ramp up characteristics

(b) 回生 Regeneration mode

(b-1) RS-485通信によるON/OFF  
ON/OFF control by RS-485

$V_o=320\text{VDC}$



Condition

$V_{\text{in}} : 240\text{VDC}$

$I_o : 0\text{A}$

$T_a : 25^\circ\text{C}$

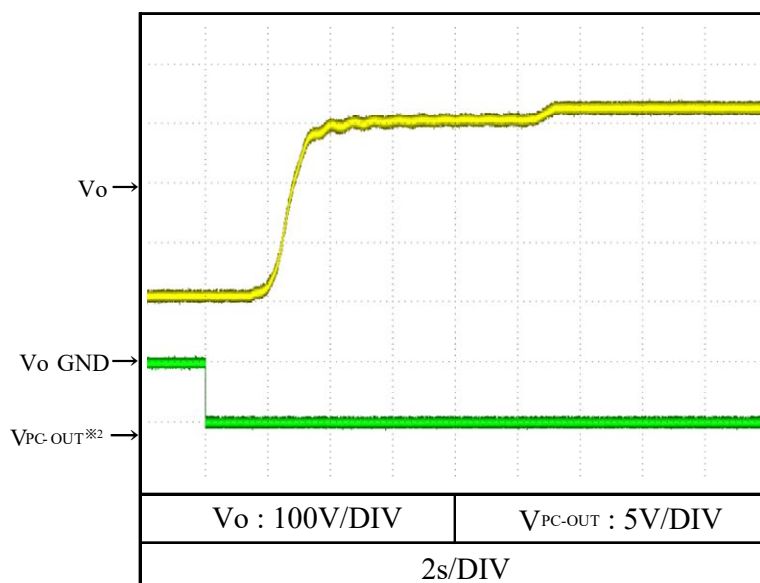
※2 半2重通信方式のため、送信信号に対し応答信号が現れます。

By half-duplex communication system, response signal and transmitted signal are output.

(b-2) 外部RUN信号によるON/OFF

ON/OFF control by external terminal

$V_o=320\text{VDC}$



Condition

$V_{\text{in}} : 240\text{VDC}$

$I_o : 0\text{A}$

$T_a : 25^\circ\text{C}$

2-8. 過渡応答(負荷急変)特性

Dynamic load response characteristics

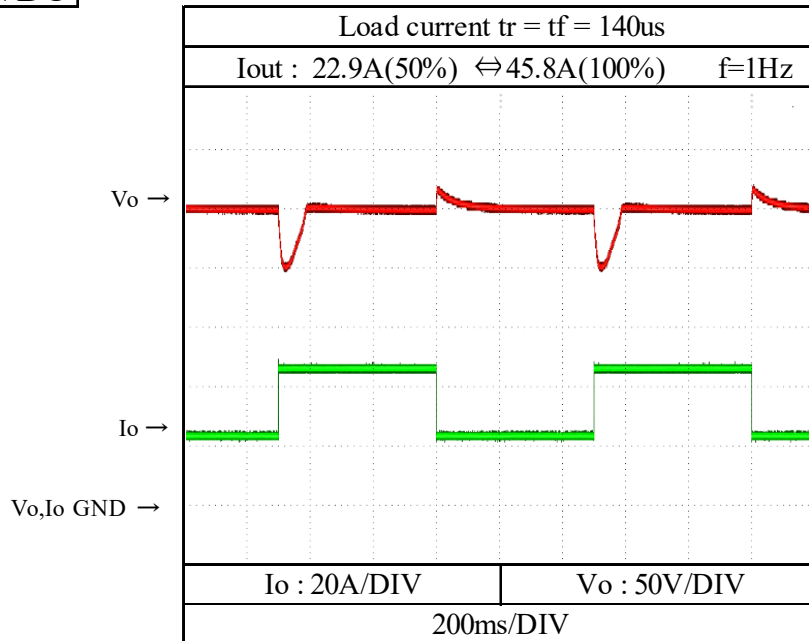
(a) 力行 Generation mode

Condition

Vin : 320VDC

Ta : 25°C

**Vo=240VDC**



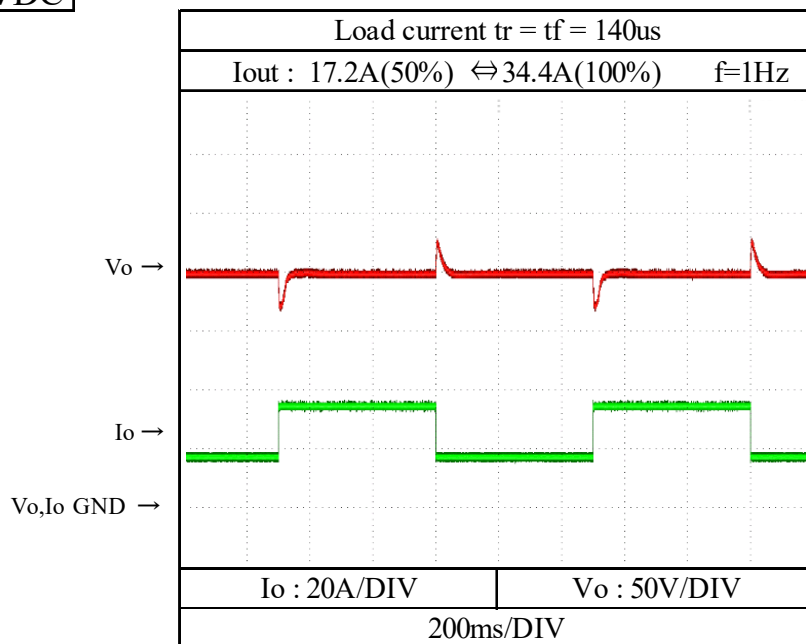
(b) 回生 Regeneration mode

Condition

Vin : 240VDC

Ta : 25°C

**Vo=320VDC**



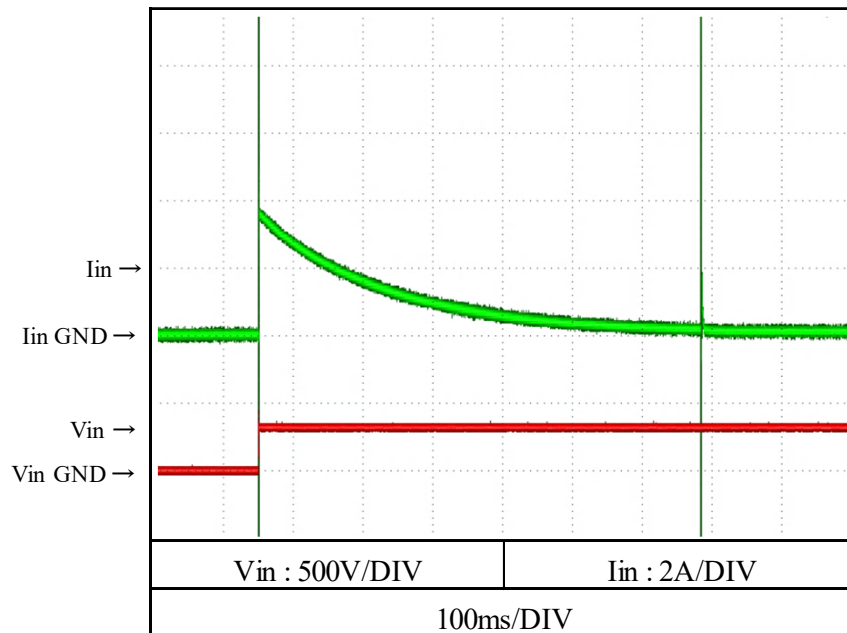


## 2-9. 入力サージ電流 (突入電流) 特性

Inrush current characteristics

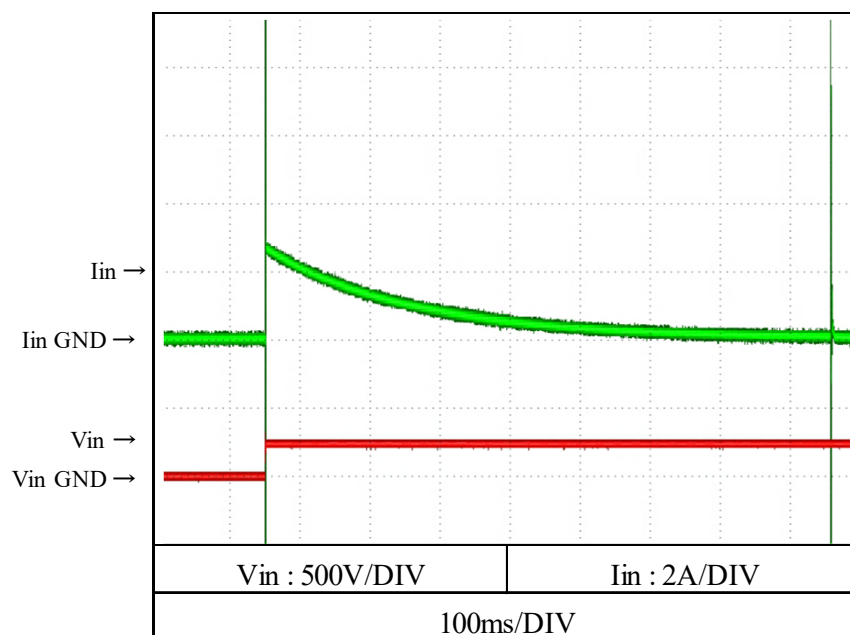
(a) グリッド側 Grid side

Condition

 $V_{in}$  : 320VDC $T_a$  : 25°C

(b) バッテリー側 Battery side

Condition

 $V_{in}$  : 240VDC $T_a$  : 25°C

2-10. 出力ノイズ波形

Output noise waveform

(a) 力行 Generation mode

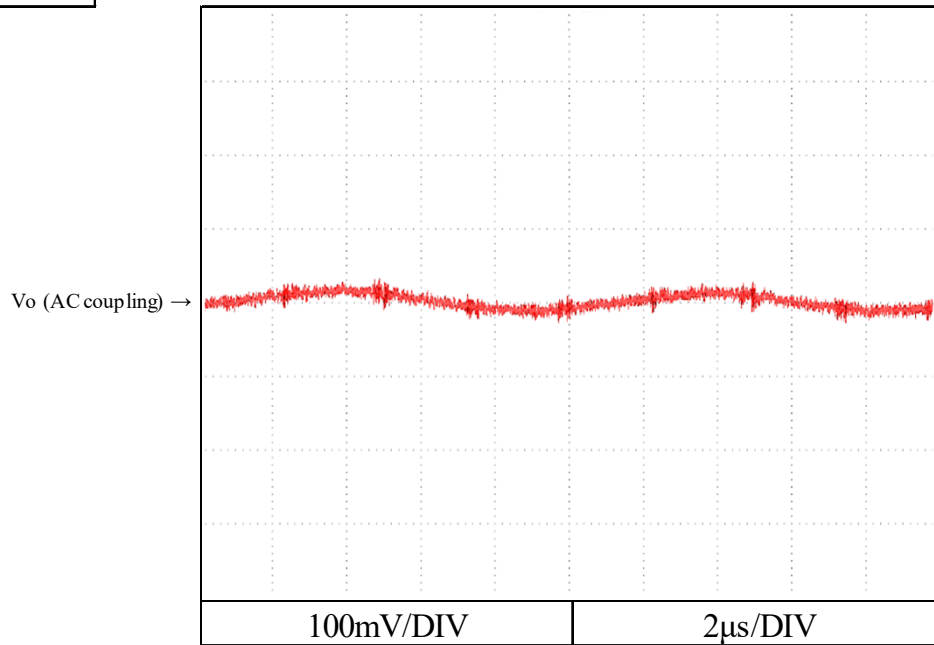
Condition

Vin : 320VDC

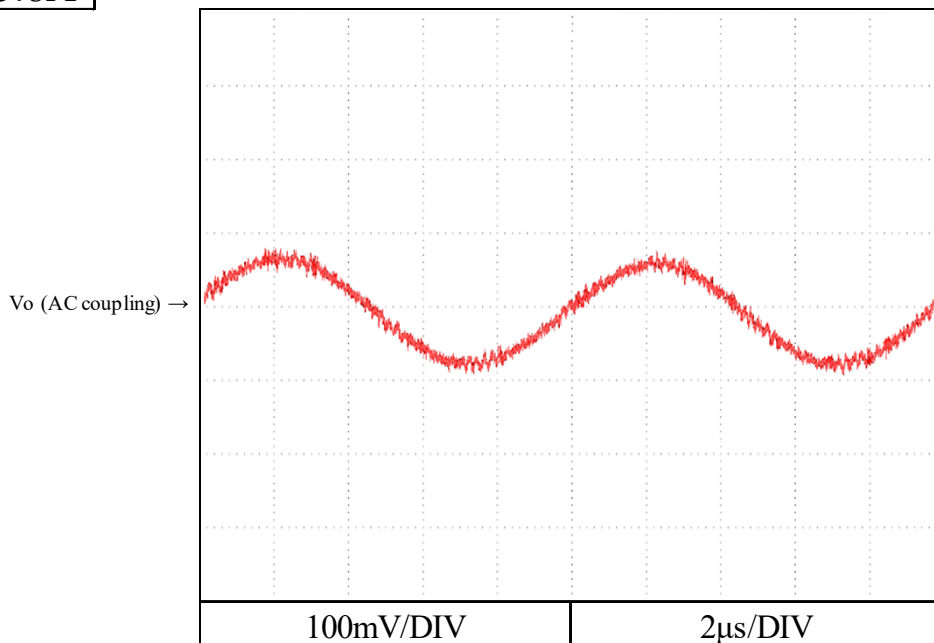
Vo : 240VDC

Ta : 25°C

**Io=0A**



**Io=45.8A**



## 2-10. 出力ノイズ波形

Output noise waveform

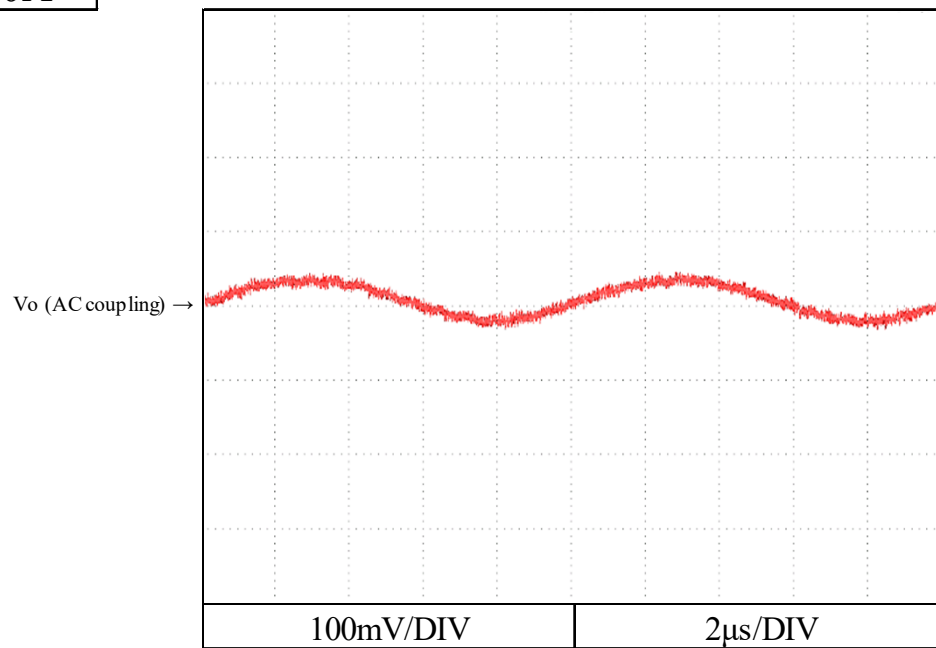
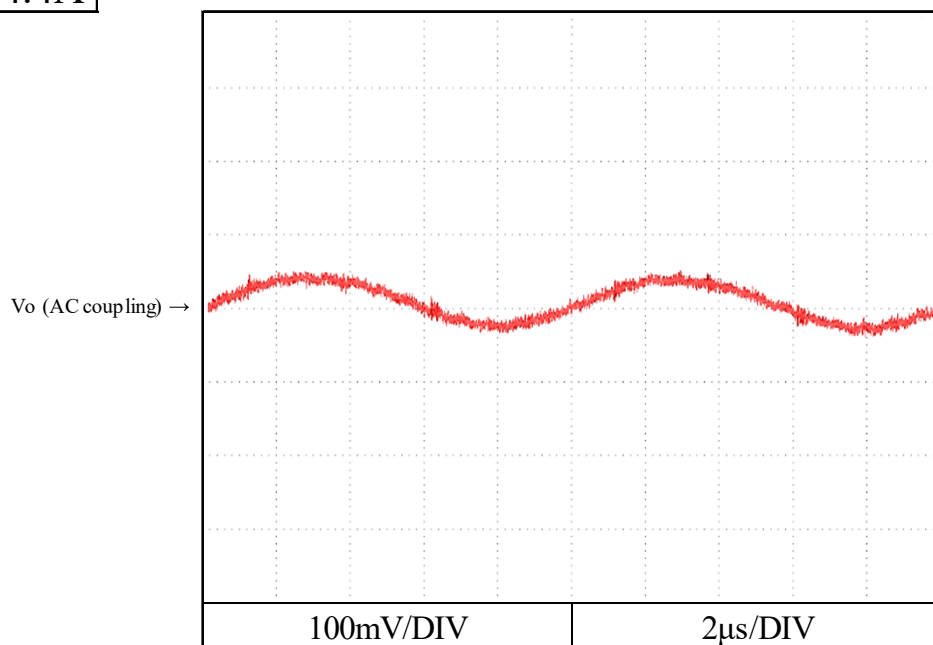
(b) 回生 Regeneration mode

Condition

Vin : 240VDC

Vo : 320VDC

Ta : 25°C

 $I_o = 0A$  $I_o = 34.4A$ 

2-11. EMI特性 Electro-Magnetic Interference characteristics

(a) 雑音端子電圧 Conducted Emission

力行 Generation mode

Condition

Vin : 320VDC

Io : 33A (8.0kW)

Ta : 25°C

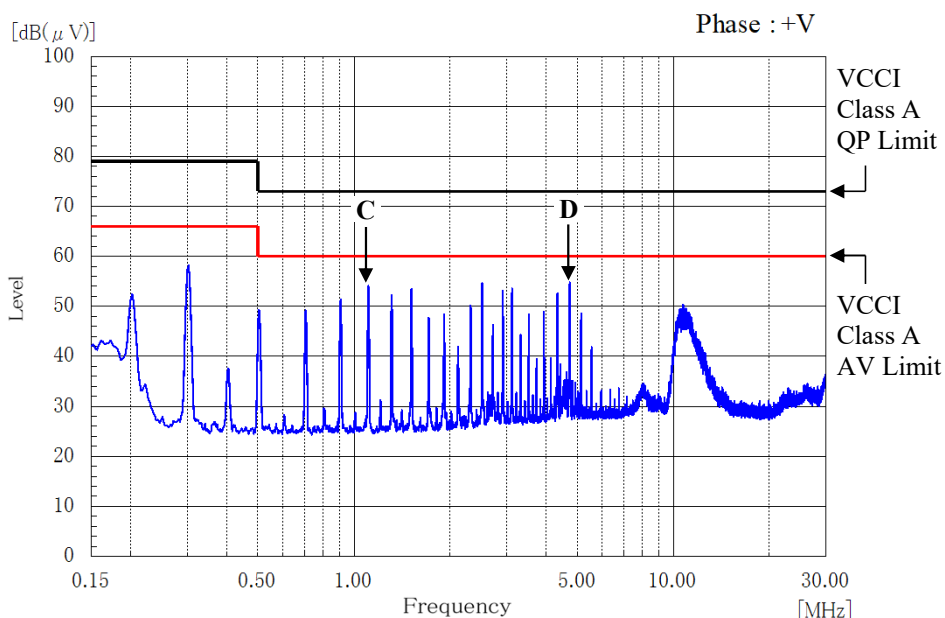
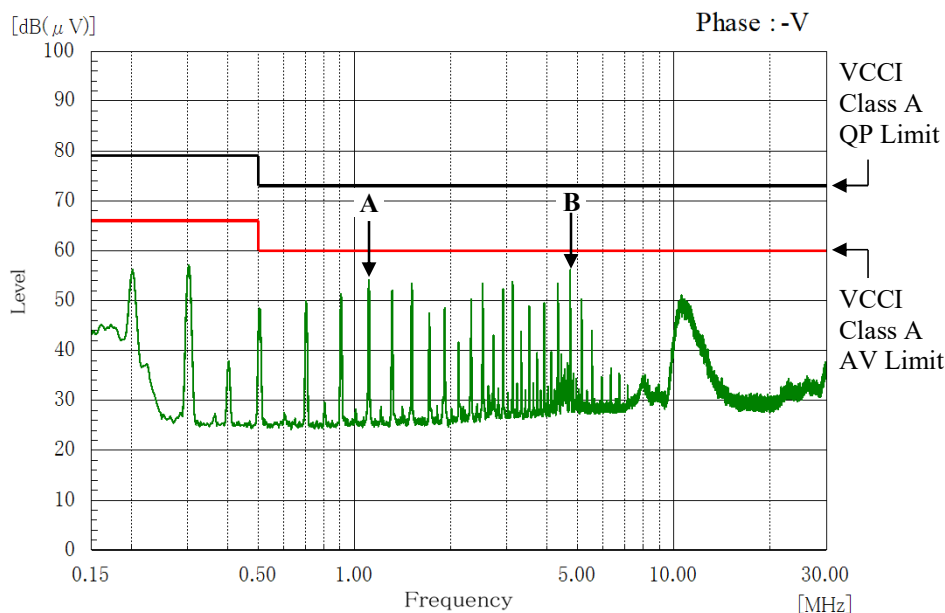
Vo = 240VDC

Point A (1.1MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	73.0	54.1
AV	60.0	54.1

Point B (4.7MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	73.0	55.9
AV	60.0	55.7

Point C (1.1MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	73.0	54.0
AV	60.0	54.0

Point D (4.7MHz)		
Ref. Data	Limit (dBuV)	Measure (dBuV)
QP	73.0	54.1
AV	60.0	53.9



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

2-11. EMI特性 Electro-Magnetic Interference characteristics

(b) 雑音電界強度 Radiated Emission

力行 Generation mode

$V_o = 240\text{VDC}$

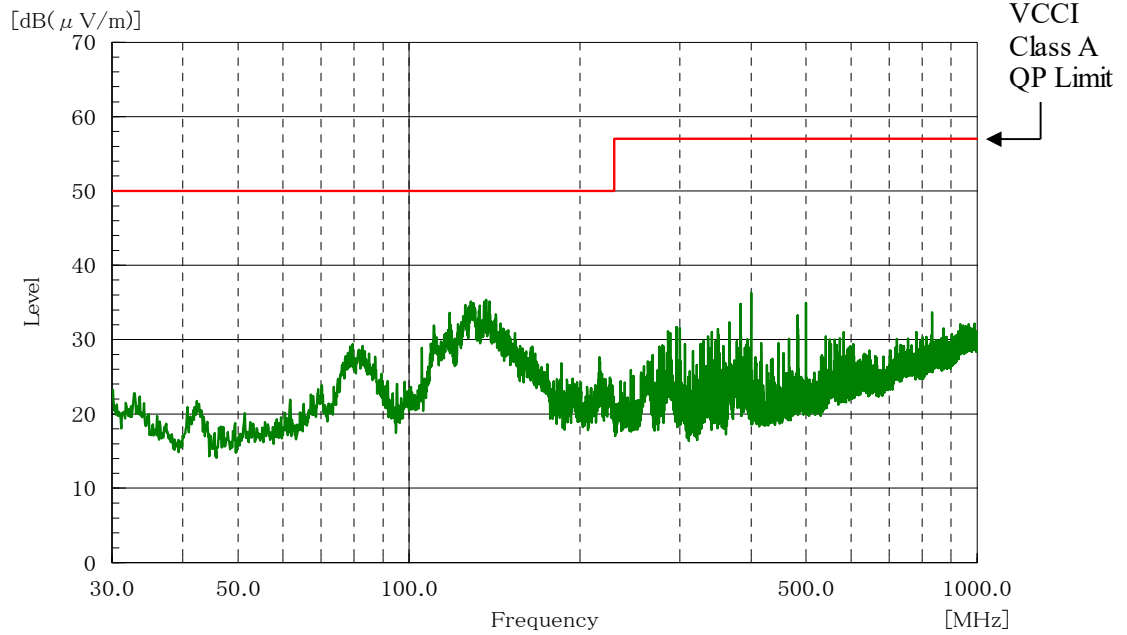
Condition

$V_{in} : 320\text{VDC}$

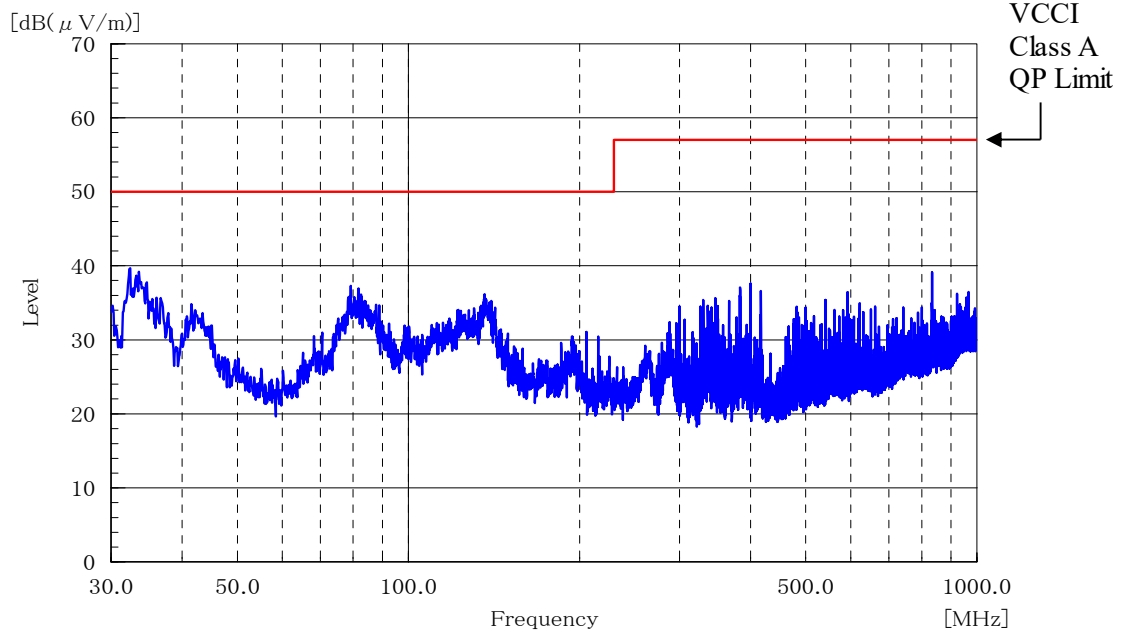
$I_o : 33\text{A (8.0kW)}$

$T_a : 25^\circ\text{C}$

HORIZONTAL



VERTICAL



EN55011-A,EN55022-Aの限界値はVCCI class Aの限界値と同じ

Limit of EN55011-A,EN55022-A are same as its VCCI class A.

表示はピーク値

Indication is peak values.

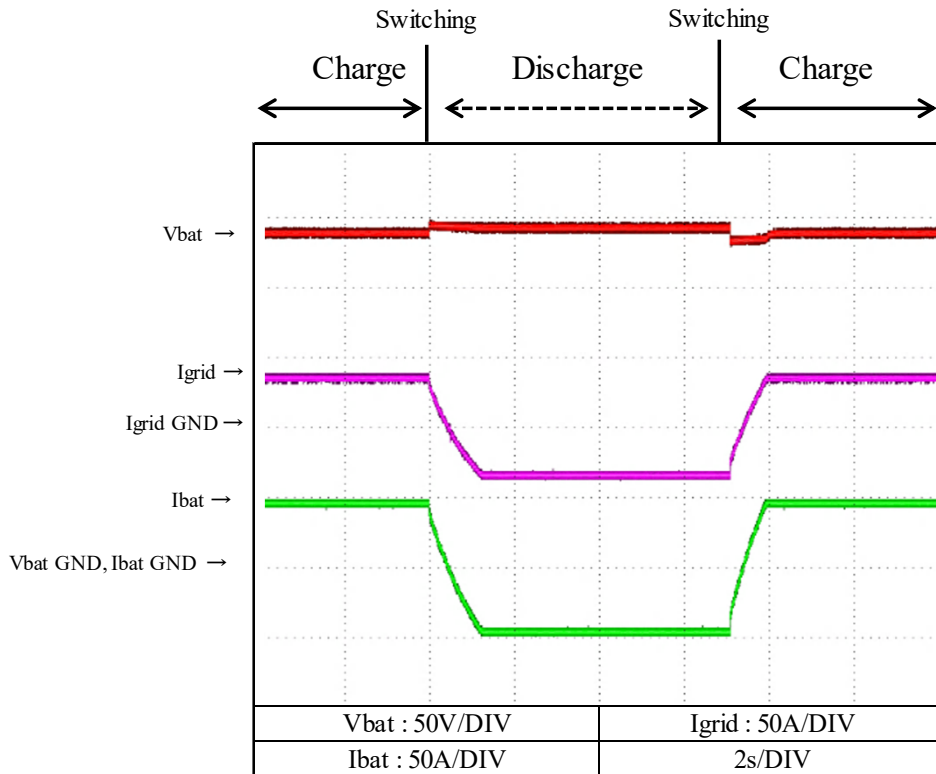
2-12. 力行・回生切替特性

Generation and Regeneration switching characteristics

(a) バッテリ自律CVモード

Automatic battery CV mode

Charge	Discharge
$V_{in}$ : 320VDC	245VDC
$V_o$ : 240VDC	320VDC
$I_{bat}$ : 45.8A	-45.8A
$T_a$ : 25°C	



Igrid, Ibatの矢印の向きが電流の正です。EZA11K-320240をバッテリー自律モードで動作させています。

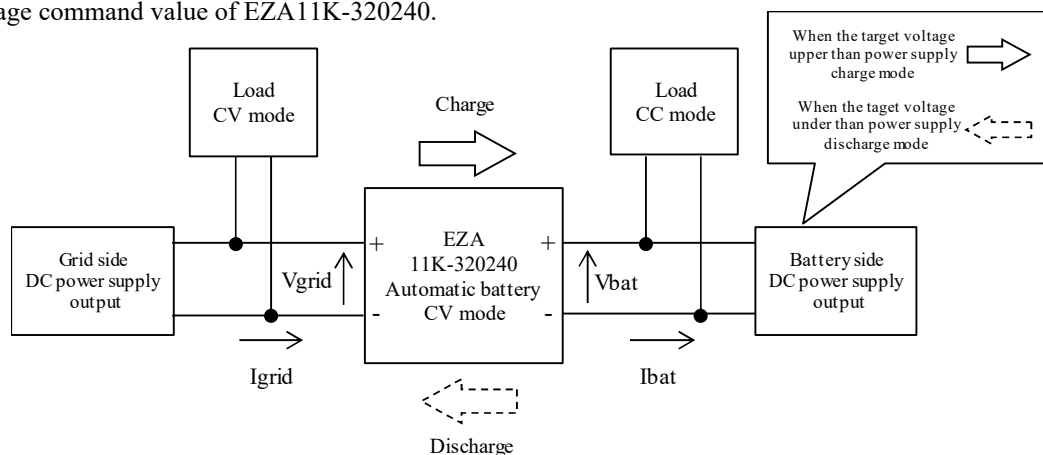
力行 ⇒ 回生 (回生 ⇒ 力行) の切り替えは、バッテリー側に接続されているDC電源の出力を

EZA11K-320240のバッテリー電圧指令値に対し、高く (低く) することで行っています。

Igrid, Ibat's arrow direction is positive current. EZA11K is operated automatic battery CV mode.

Switching between Generation mode ⇒ Regeneration mode (Regeneration mode ⇒ Generation mode)

is done by increasing (decreasing) the output of DC power supply connected to the battery side to the voltage command value of EZA11K-320240.



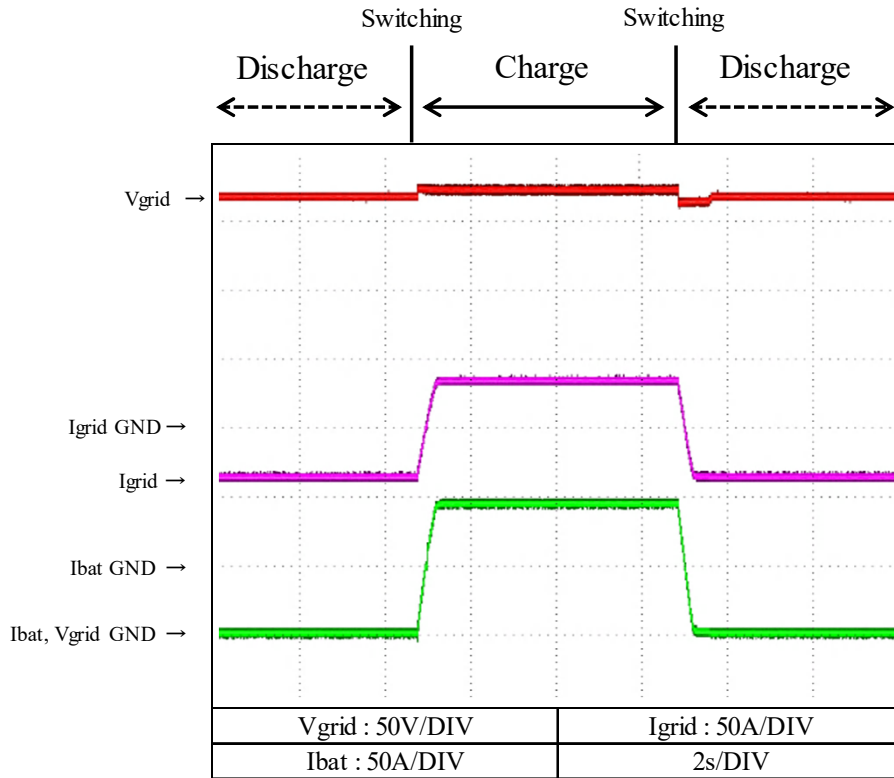
2-12. 力行・回生切替特性

Generation and Regeneration switching characteristics

(b) グリッド自律CVグリッドCCモード

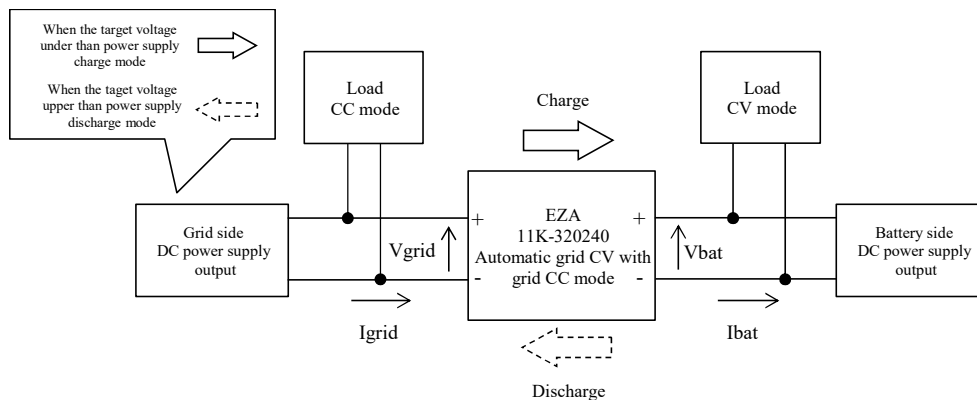
Automatic grid CV with grid CC mode

	Charge	Discharge
$V_{in}$	325VDC	240VDC
$V_o$	240VDC	320VDC
$I_{grid}$	35.2A	-34.4A
$T_a$	25°C	



$I_{grid}, I_{bat}$ の矢印の向きが電流の正です。EZA11K-320240をグリッド自律モードで動作させています。回生 ⇒ 力行 (力行 ⇒ 回生) の切り替えは、グリッド側に接続されているDC電源の出力をEZA11K-320240のグリッド電圧指令値に対し、高く (低く) することで行います。

$I_{grid}$  ,  $I_{bat}$ 's arrow direction is positive current. EZA11K is operated automatic grid CV mode. Switching between Regeneration mode ⇒ Generation mode (Generation mode ⇒ Regeneration mode) is done by increasing (decreasing) the output of DC power supply connected to the grid side to the voltage command value of EZA11K-320240.



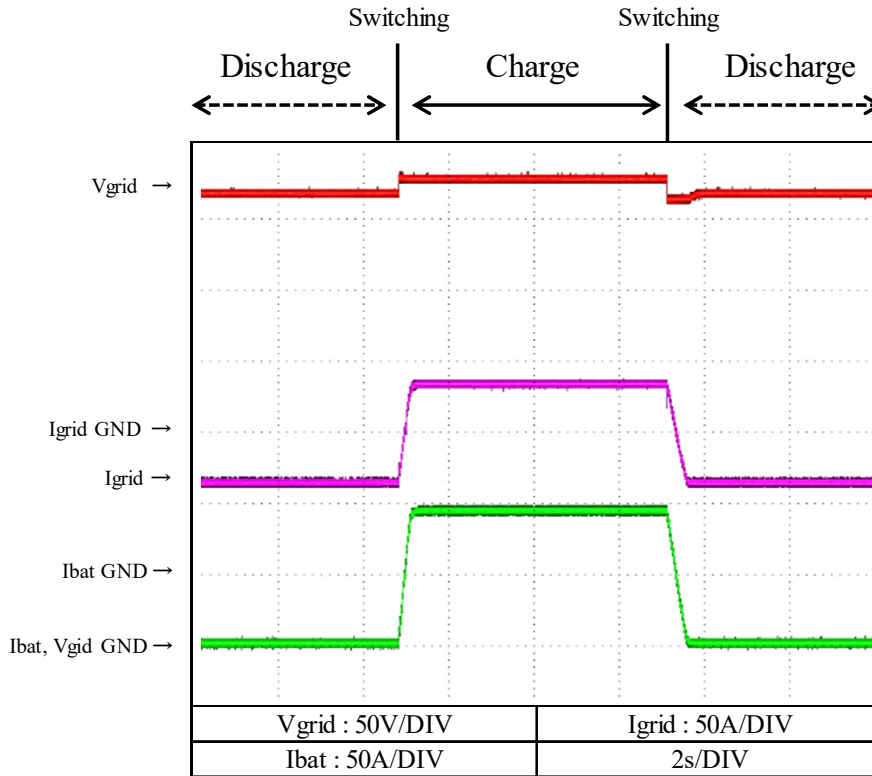
2-12. 力行・回生切替特性

Generation and Regeneration switching characteristics

(c) グリッド自律CVバッテリーCCモード

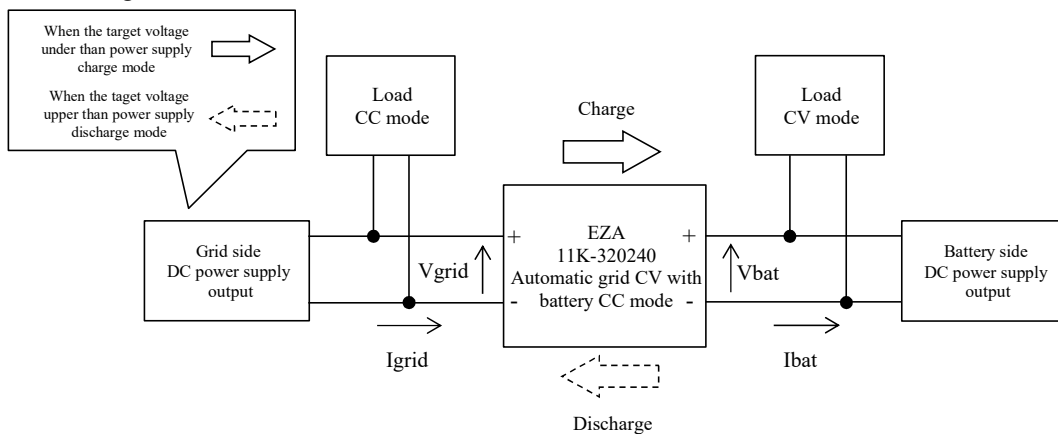
Automatic grid CV with battery CC mode

	Charge	Discharge
$V_{in}$	330VDC	240VDC
$V_o$	240VDC	320VDC
$I_{bat}$	45.3A	-47.8A
$T_a$	25°C	



$I_{grid}, I_{bat}$ の矢印の向きが電流の正です。EZA11K-320240をグリッド自律モードで動作させています。回生 ⇒ 力行 (力行 ⇒ 回生) の切り替えは、グリッド側に接続されているDC電源の出力をEZA11K-320240のグリッド電圧指令値に対し、高く (低く) することで行います。

$I_{grid}$  ,  $I_{bat}$ 's arrow direction is positive current. EZA11K is operated automatic grid CV mode. Switching between Regeneration mode ⇒ Generation mode (Generation mode ⇒ Regeneration mode) is done by increasing (decreasing) the output of DC power supply connected to the grid side to the voltage command value of EZA11K-320240.



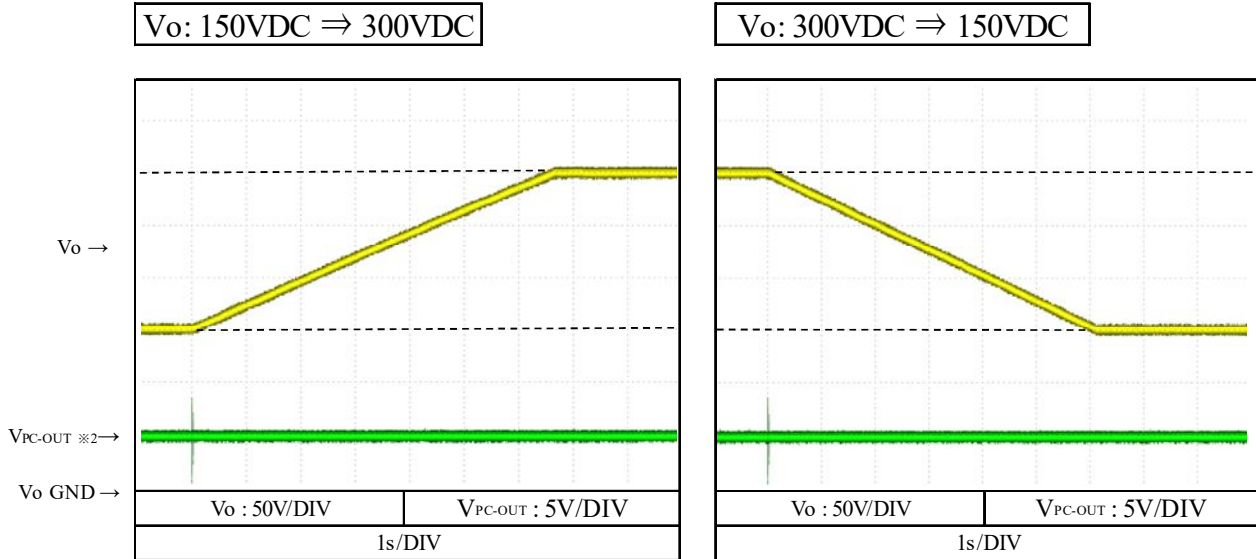


2-13. 出力電圧指令応答特性

Output voltage command response characteristics

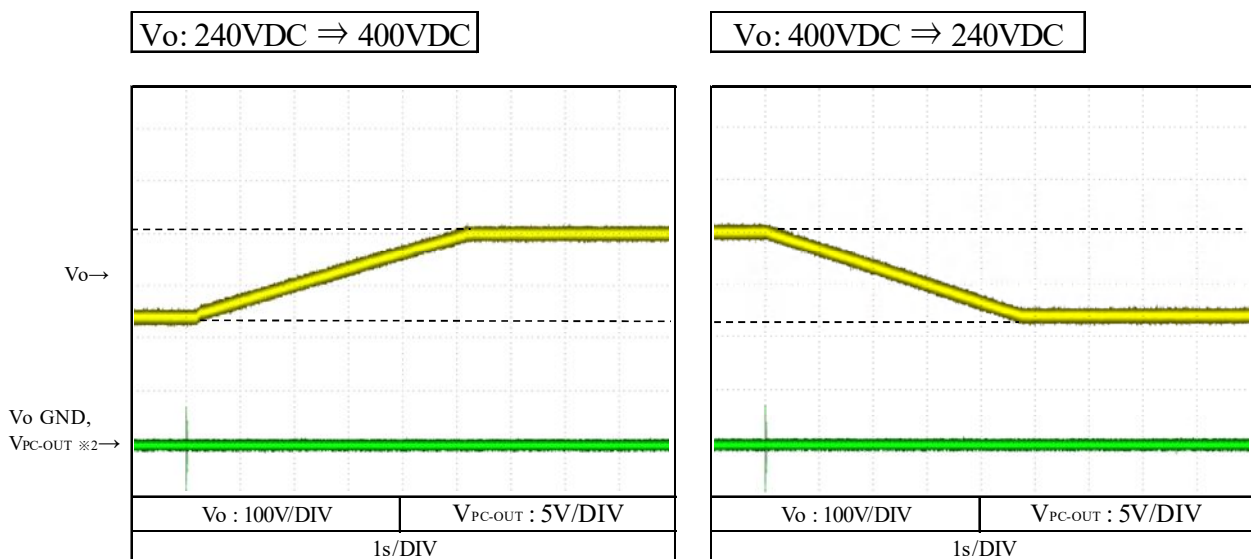
(a) 力行 Generation mode

Condition  
 Vin : 320VDC  
 Io : 36.5A  
 Ta : 25°C



(b) 回生 Regeneration mode

Condition  
 Vin : 240VDC  
 Io : 27.5A  
 Ta : 25°C



※2 半2重通信方式のため、送信信号に対し応答信号が現れます。

By half-duplex communication system, response signal and transmitted signal are output.

## 2-14. 定電流指令応答特性

Constant current command response characteristics

## (a) 力行 Generation mode

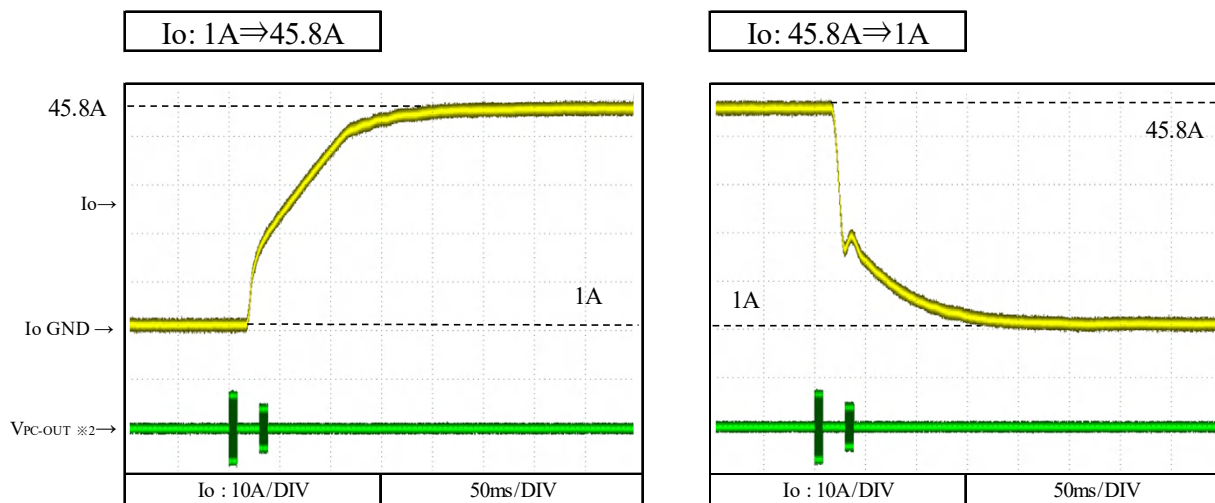
Condition

Vin : 320VDC

Vo : 240VDC

Ta : 25°C

Target battery voltage : 270VDC



## (b) 回生 Regeneration mode

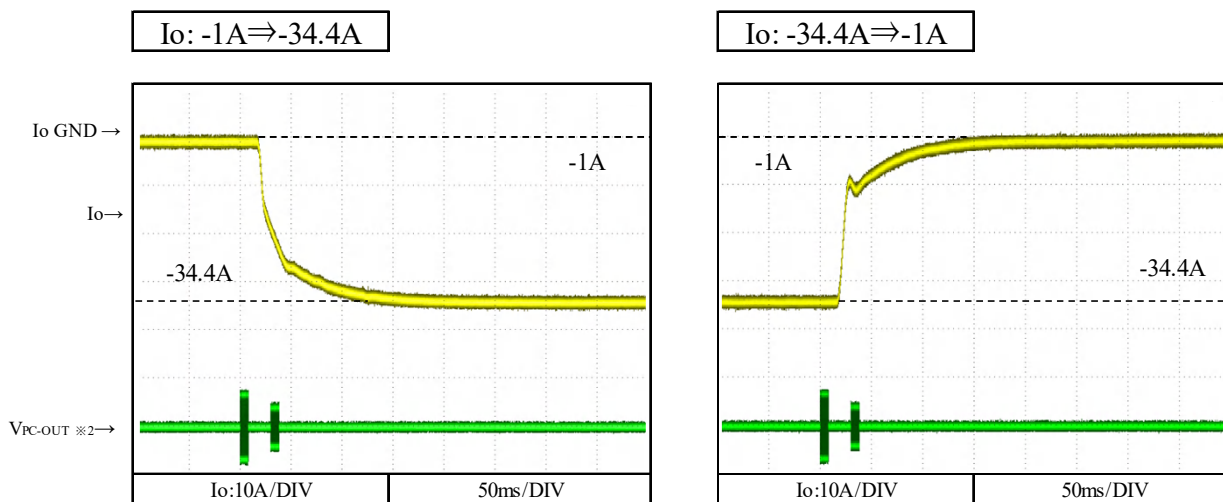
Condition

Vin : 240VDC

Vo : 320VDC

Ta : 25°C

Target grid voltage : 360VDC



※2 半2重通信方式のため、送信信号に対し応答信号が現れます。

By half-duplex communication system, response signal and transmitted signal are output.

2-15. バッテリ保護特性

Battery protection characteristics

(a) グリッド自律CVバッテリーCCモード【充電】

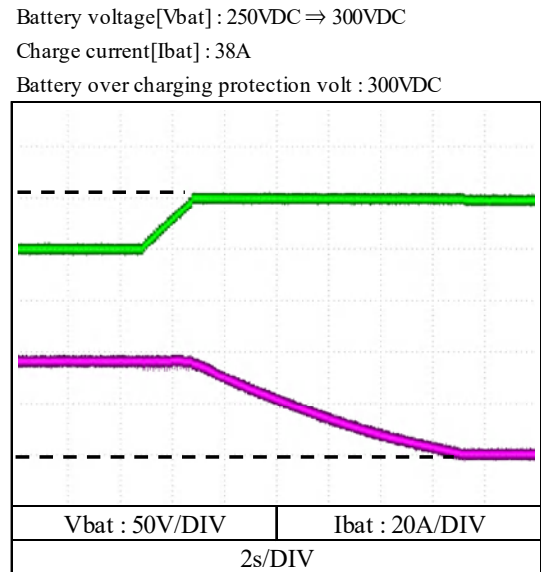
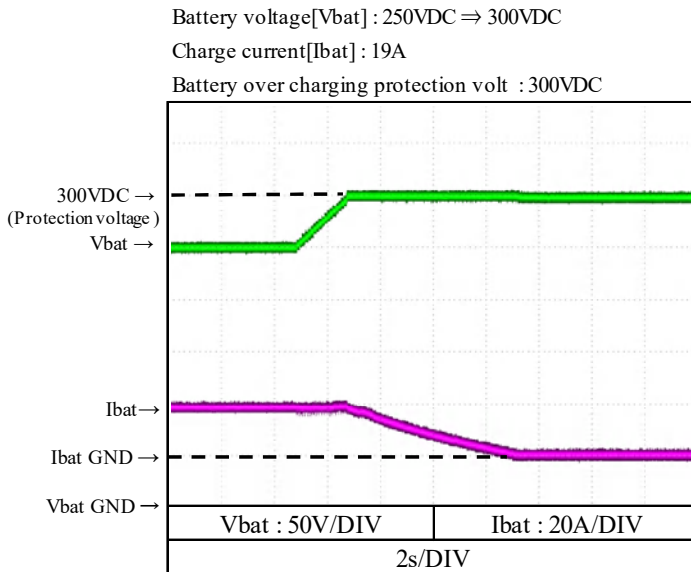
Automatic grid CV with battery CC mode [charge]

Condition

$V_{in}$  : 320VDC

$V_o$  : 250VDC  $\Rightarrow$  300VDC

$T_a$  : 25°C



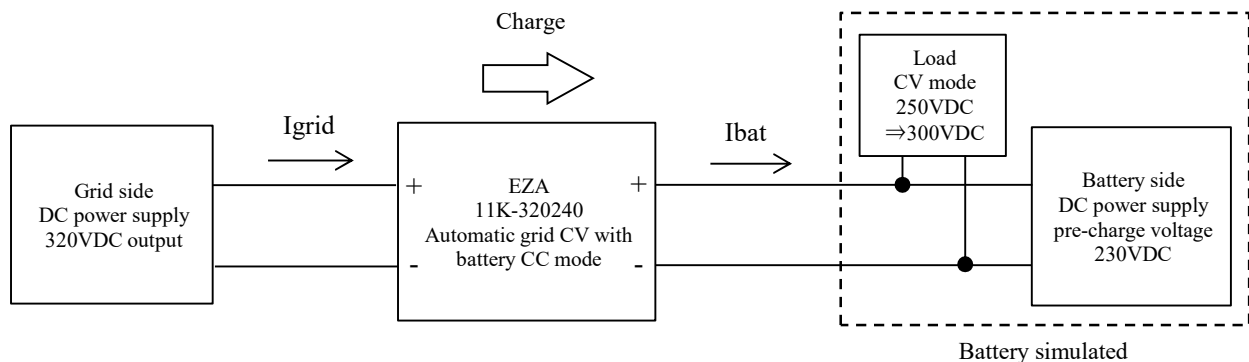
充電電流は上記波形では正方向になります。

バッテリー電圧Vbatがバッテリー充電上限電圧設定値(バッテリー目標電圧)まで上昇すると、充電電流Ibatを制限しバッテリー電圧が設定電圧以上にならないよう動作します。

Charge current is positive current in the above waveform.

When battery voltage reaches to over charging protection volt (target battery voltage),

EZA limits charge current and keeps battery voltage under protection voltage.



2-15. バッテリ保護特性

Battery protection characteristics

(b) グリッド自律CVグリッドCCモード【充電】

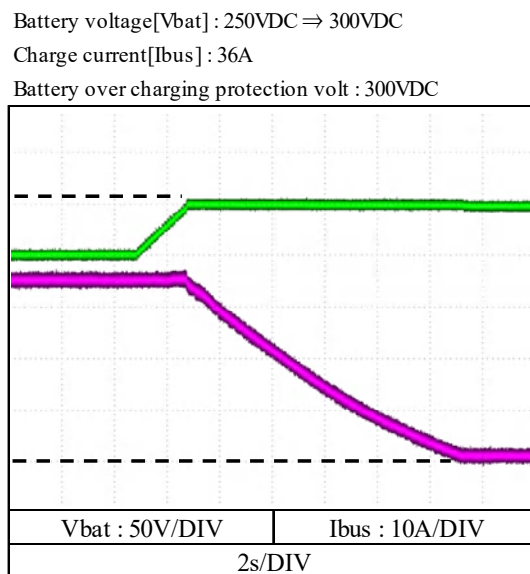
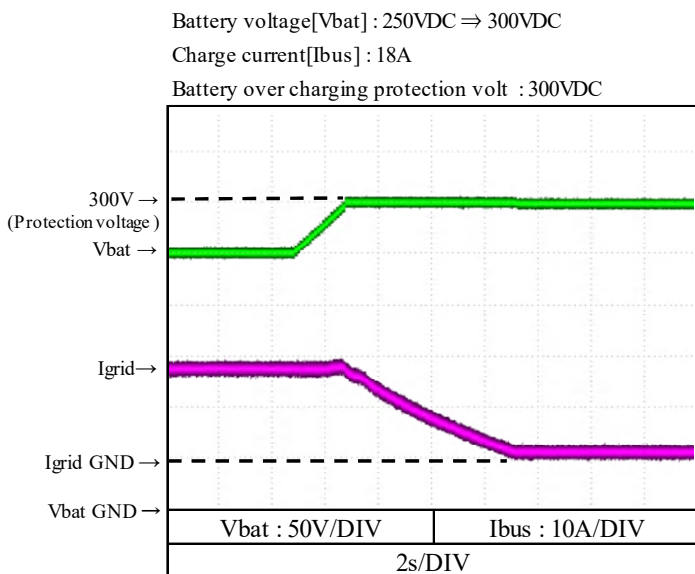
Automatic grid CV with grid CC mode [charge]

Condition

$V_{in}$  : 320VDC

$V_o$  : 250VDC  $\Rightarrow$  300VDC

$T_a$  : 25°C



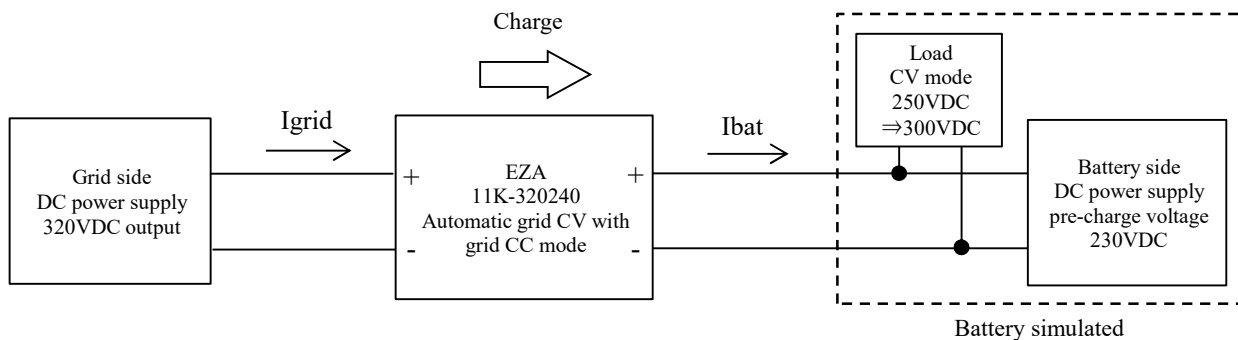
充電電流は上記波形では正方向になります。

バッテリー電圧Vbatがバッテリー充電上限電圧設定値(バッテリー目標電圧)まで上昇すると、充電電流Igridを制限しバッテリー電圧が設定電圧以上にならないよう動作します。

Charge current is positive current in the above waveform.

When battery voltage reaches to over charging protection volt (target battery voltage),

EZA limits charge current and keeps battery voltage under protection voltage.



2-15. バッテリ保護特性

Battery protection characteristics

(c) グリッドCV自律バッテリーCCモード【放電】

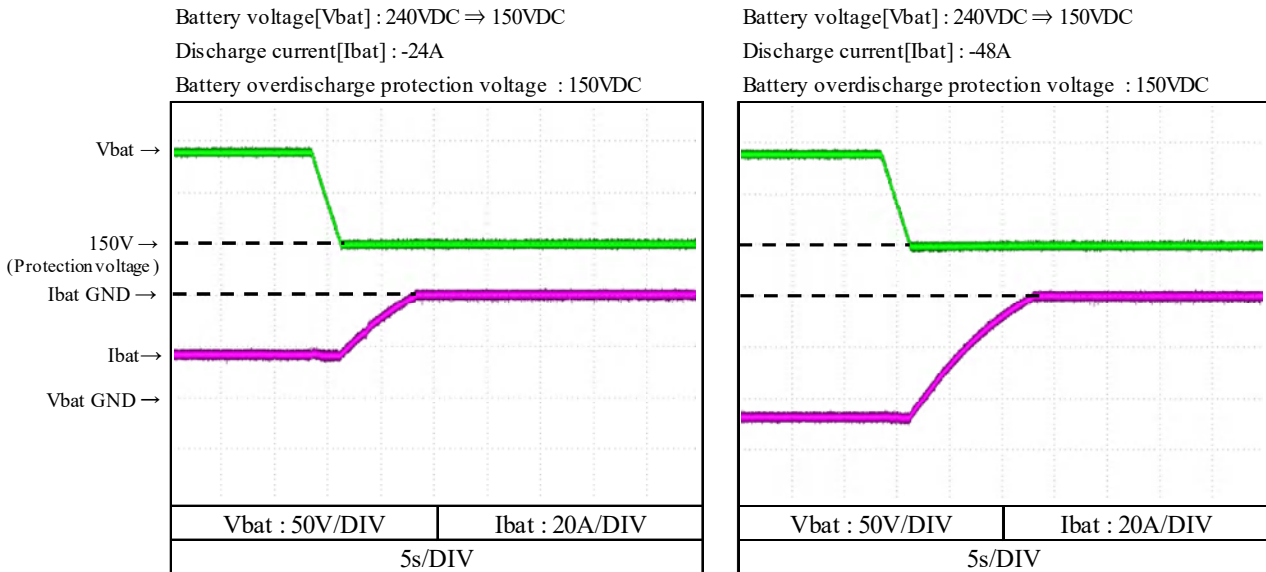
Automatic grid CV with battery CC mode [discharge]

Condition

$V_{in}$  : 240VDC  $\Rightarrow$  150VDC

$V_o$  : 320VDC

$T_a$  : 25°C



放電電流は上記波形では負方向になります。

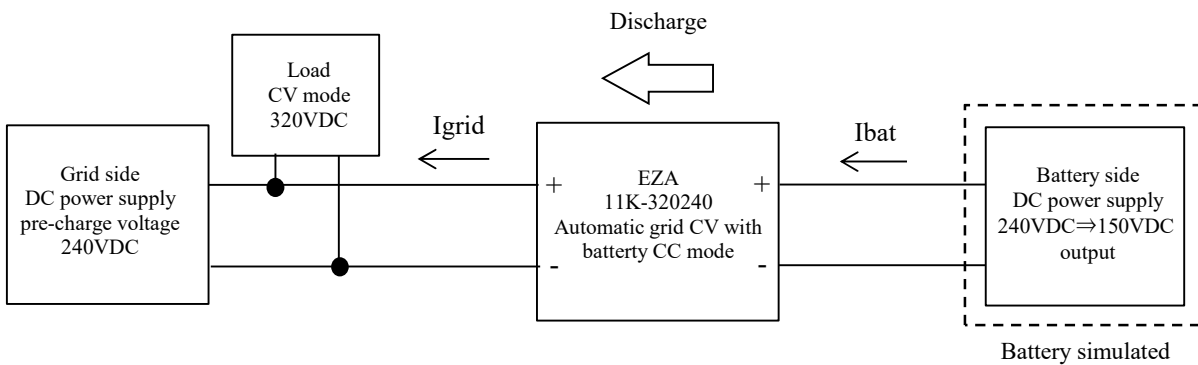
バッテリー電圧Vbatがバッテリー放電終止電圧設定値まで下降すると、放電電流Ibatを制限し

バッテリー電圧が設定電圧以下にならないよう動作します。

Discharge current is negative current in the above waveform.

When battery voltage reaches to over discharging protection volt,

EZA limits discharge current and keeps battery voltage under protection voltage.



2-15. バッテリ保護特性

Battery protection characteristics

(d) グリッド自律CVグリッドCCモード【放電】

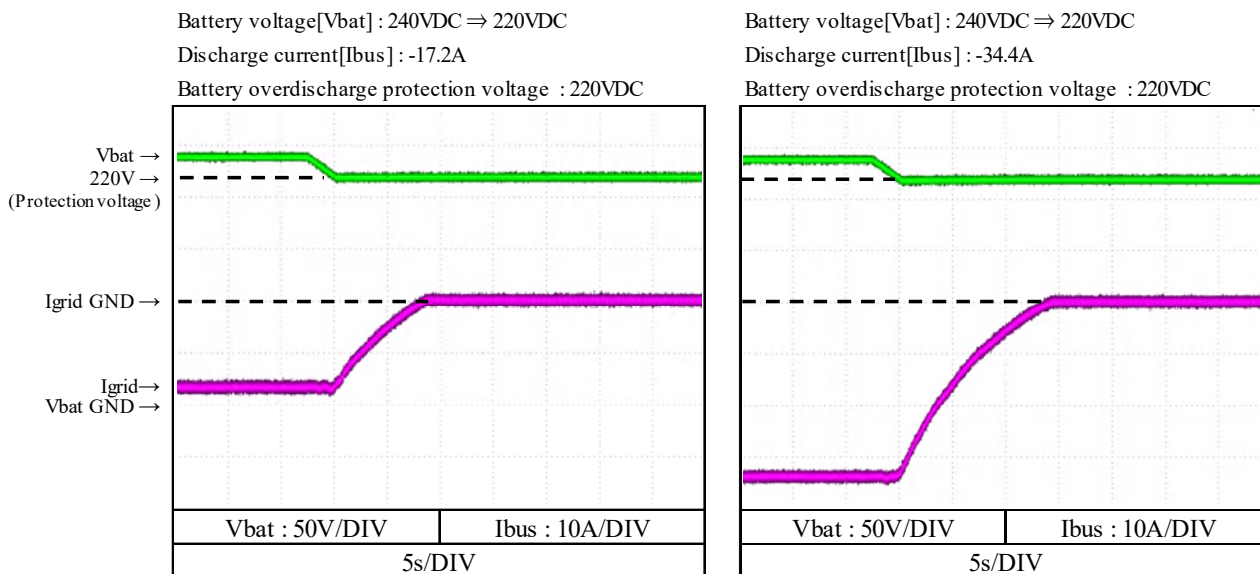
Automatic grid CV with grid CC mode [discharge]

Condition

$V_{in}$  : 240VDC  $\Rightarrow$  220VDC

$V_o$  : 320VDC

$T_a$  : 25°C



放電電流は上記波形では負方向になります。

バッテリー電圧Vbatがバッテリー放電終止電圧設定値まで下降すると、放電電流Igridを制限し  
 バッテリー電圧が設定電圧以下にならないよう動作します。

Discharge current is negative current in the above waveform.

When battery voltage reaches to over discharging protection volt,  
 EZA limits discharge current and keeps battery voltage under protection voltage.

