

**i6A24014A033V-001-R**

**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>o</sub> .....	出力電圧	Output voltage
V <sub>rc</sub> .....	RC電圧	RC voltage
I <sub>in</sub> .....	入力電流	Input current
I <sub>o</sub> .....	出力電流	Output current
T <sub>a</sub> .....	周囲温度	Ambient temperature
f .....	周波数	Frequency

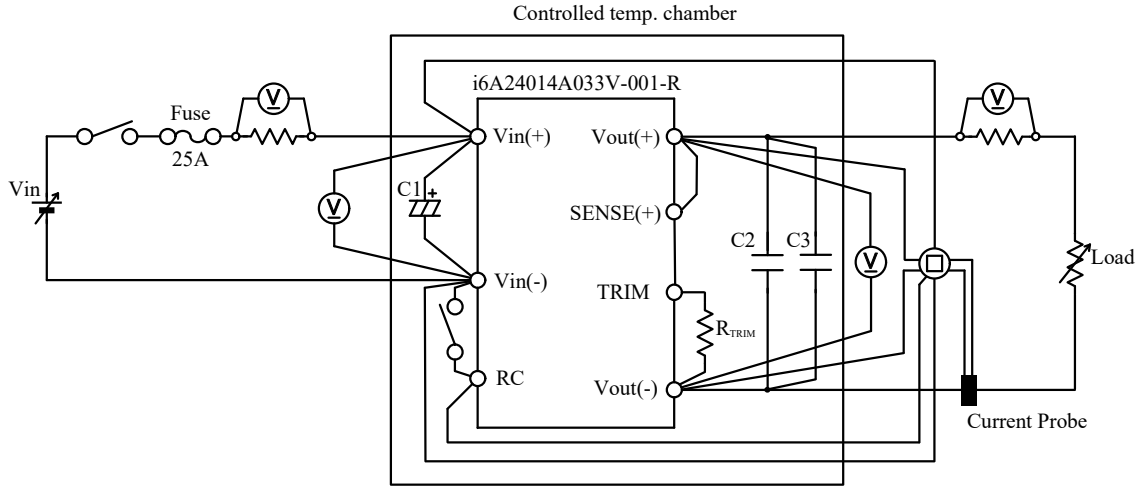
※ 当社測定条件における結果であり、参考値としてお考え願います。  
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

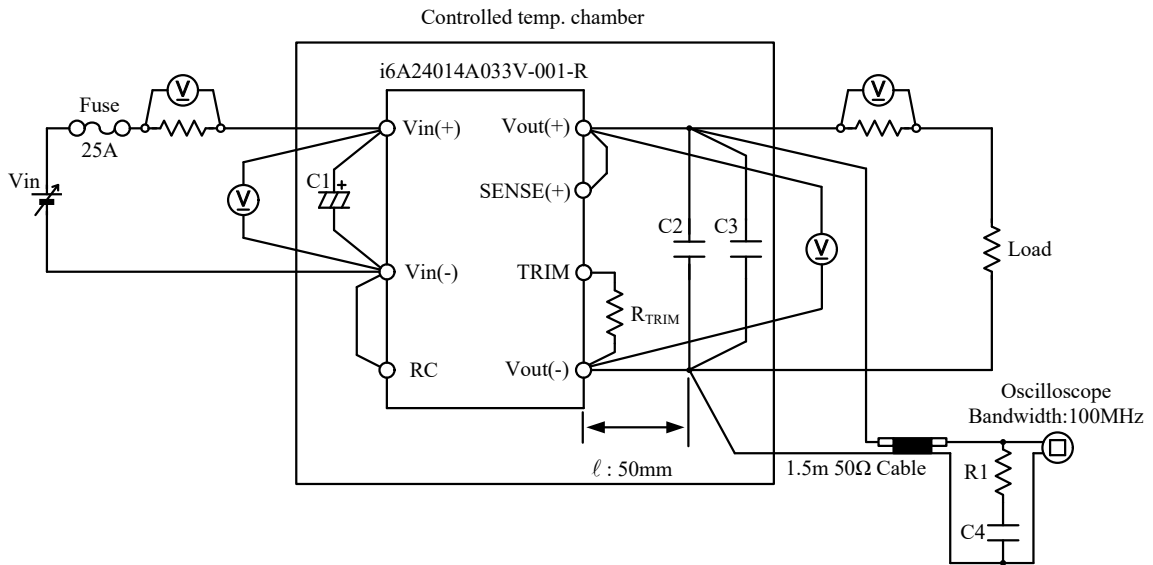
1-1. 測定回路 Measurement Circuits

(1) 静特性、待機電力特性、通電ドリフト特性、その他特性

Steady state, Standby power, Warm up voltage drift and Other characteristics



(2) 出力リップル、ノイズ電圧波形 Output ripple and noise voltage and waveform



- |                  |                        |
|------------------|------------------------|
| C1 : 120 $\mu$ F | Electrolytic Capacitor |
| C2 : 22 $\mu$ F  | Ceramic Capacitor      |
| C3 : 1000pF      | Ceramic Capacitor      |
| C4 : 4700pF      | Ceramic Capacitor      |
| R1 : 50 $\Omega$ |                        |

## 1-2. 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DLM2054 / DL9040L
2	DIGITAL STORAGE OSCILLOSCOPE	LeCroy	6050A
3	DIGITAL MULTIMETER	AGILENT	34970A
4	CURRENT PROBE	YOKOGAWA ELECT.	701929
5	SHUNT RESISTER	YOKOGAWA ELECT.	2215
6	DYNAMIC DUMMY LOAD	TAKASAGO	FK-600L
7	DC POWER SUPPLY	KIKUSUI	PWR800L
8	CONTROLLED TEMP. CHAMBER	ESPEC	SU-641

## 2. 特性データ Characteristics

## 2-1 静特性 Steady state data

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

**Vo=3.3V** 1. Regulation - line and load

Condition Ta : 25 °C

Io \ Vin	9VDC	12VDC	24VDC	40VDC	Line regulation	
0%	3.314V	3.314V	3.314V	3.313V	1mV	0.030%
50%	3.303V	3.303V	3.303V	3.304V	1mV	0.030%
100%	3.292V	3.291V	3.290V	3.288V	4mV	0.121%
Load regulation	22mV	23mV	24mV	25mV		
	0.667%	0.697%	0.727%	0.758%		

2. Temperature drift

Conditions Vin : 24 VDC

Io : 100 %

Ta	-40°C	25°C	85°C	Temperature stability	
Vo	3.275V	3.290V	3.295V	20mV	0.606%

**Vo=5V** 1. Regulation - line and load

Condition Ta : 25 °C

Io \ Vin	9VDC	12VDC	24VDC	40VDC	Line regulation	
0%	5.028V	5.029V	5.030V	5.031V	3mV	0.060%
50%	5.011V	5.011V	5.012V	5.012V	1mV	0.020%
100%	4.995V	4.994V	4.992V	4.988V	7mV	0.140%
Load regulation	33mV	35mV	38mV	43mV		
	0.660%	0.700%	0.760%	0.860%		

2. Temperature drift

Conditions Vin : 24 VDC

Io : 100 %

Ta	-40°C	25°C	85°C	Temperature stability	
Vo	4.965V	4.992V	5.004V	39mV	0.780%

**Vo=12V** 1. Regulation - line and load

Condition Ta : 25 °C

Io \ Vin	16VDC	24VDC	40VDC	Line regulation	
0%	12.076V	12.082V	12.084V	8mV	0.067%
50%	12.036V	12.036V	12.033V	3mV	0.025%
100%	11.995V	11.991V	11.977V	18mV	0.150%
Load regulation	81mV	91mV	107mV		
	0.675%	0.758%	0.892%		

2. Temperature drift

Conditions Vin : 24 VDC

Io : 100 %

Ta	-40°C	25°C	85°C	Temperature stability	
Vo	11.932V	11.991V	12.018V	86mV	0.717%

## 2. 特性データ Characteristics

### 2-1 静特性 Steady state data

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

**Vo=15V**

1. Regulation - line and load

Condition Ta : 25 °C

Io \ Vin	19VDC	24VDC	40VDC	Line regulation	
0%	15.081V	15.091V	15.094V	13mV	0.087%
50%	15.034V	15.034V	15.029V	5mV	0.033%
100%	14.984V	14.978V	14.960V	24mV	0.160%
Load regulation	97mV	113mV	134mV		
	0.647%	0.753%	0.893%		

2. Temperature drift

Conditions Vin : 24 VDC

Io : 100 %

Ta	-40°C	25°C	85°C	Temperature stability	
Vo	14.904V	14.978V	15.020V	116mV	0.773%

**Vo=24V**

1. Regulation - line and load

Condition Ta : 25 °C

Io \ Vin	28VDC	36VDC	40VDC	Line regulation	
0%	24.145V	24.155V	24.157V	12mV	0.050%
50%	24.086V	24.081V	24.084V	5mV	0.021%
100%	24.020V	24.005V	24.003V	17mV	0.071%
Load regulation	125mV	150mV	154mV		
	0.521%	0.625%	0.642%		

2. Temperature drift

Conditions Vin : 36 VDC

Io : 100 %

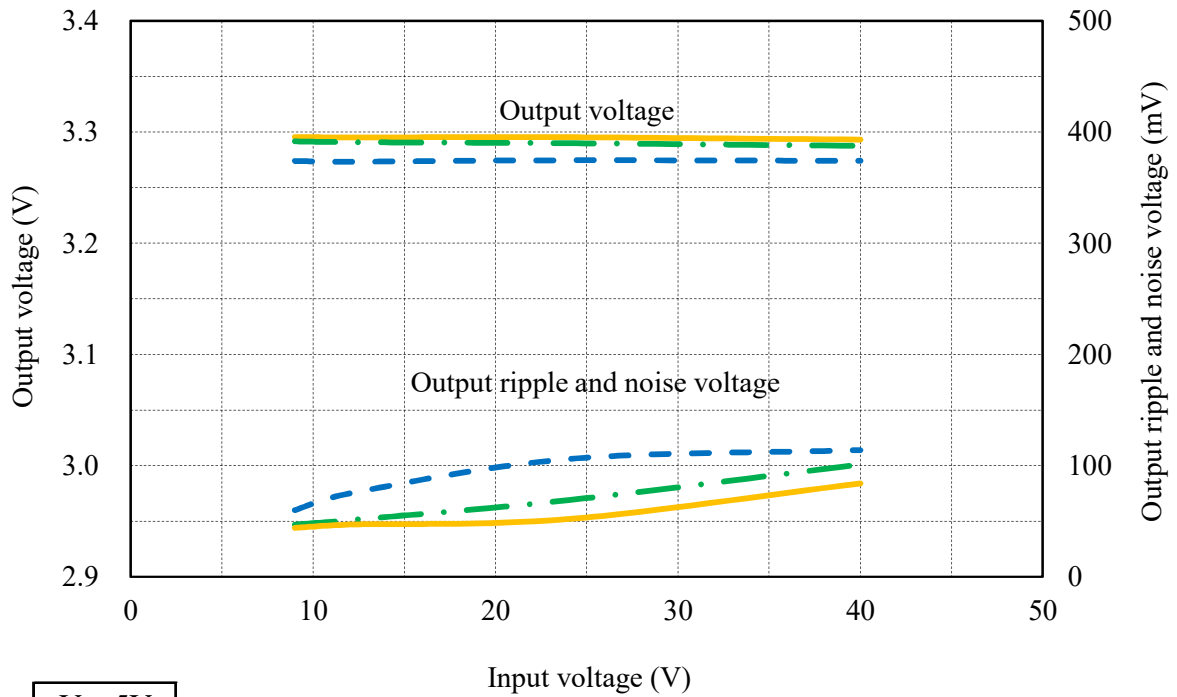
Ta	-40°C	25°C	85°C	Temperature stability	
Vo	23.877V	24.005V	24.055V	178mV	0.742%

(2) 出力電圧・出力リップルノイズ電圧 対 入力電圧

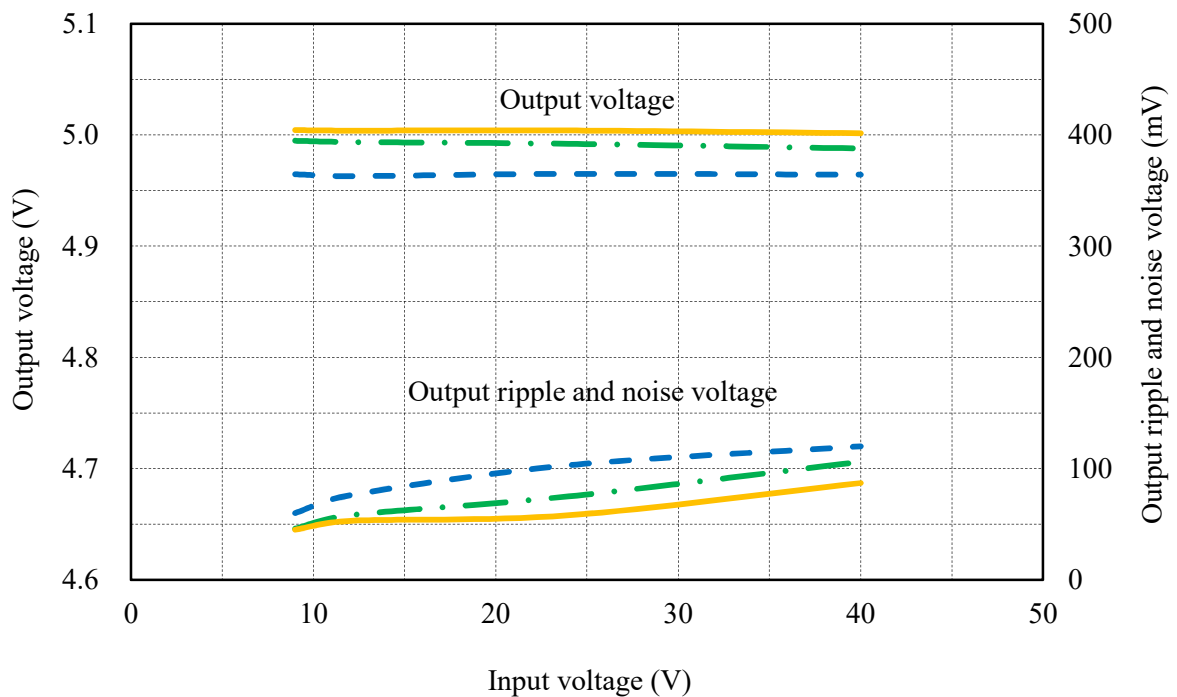
Output voltage and Output ripple and noise voltage vs. Input voltage

Conditions  $I_o$  : 100 %  
 $T_a$  : -40 °C — — — —  
           : 25 °C - · - · -  
           : 85 °C —————

$V_o=3.3V$



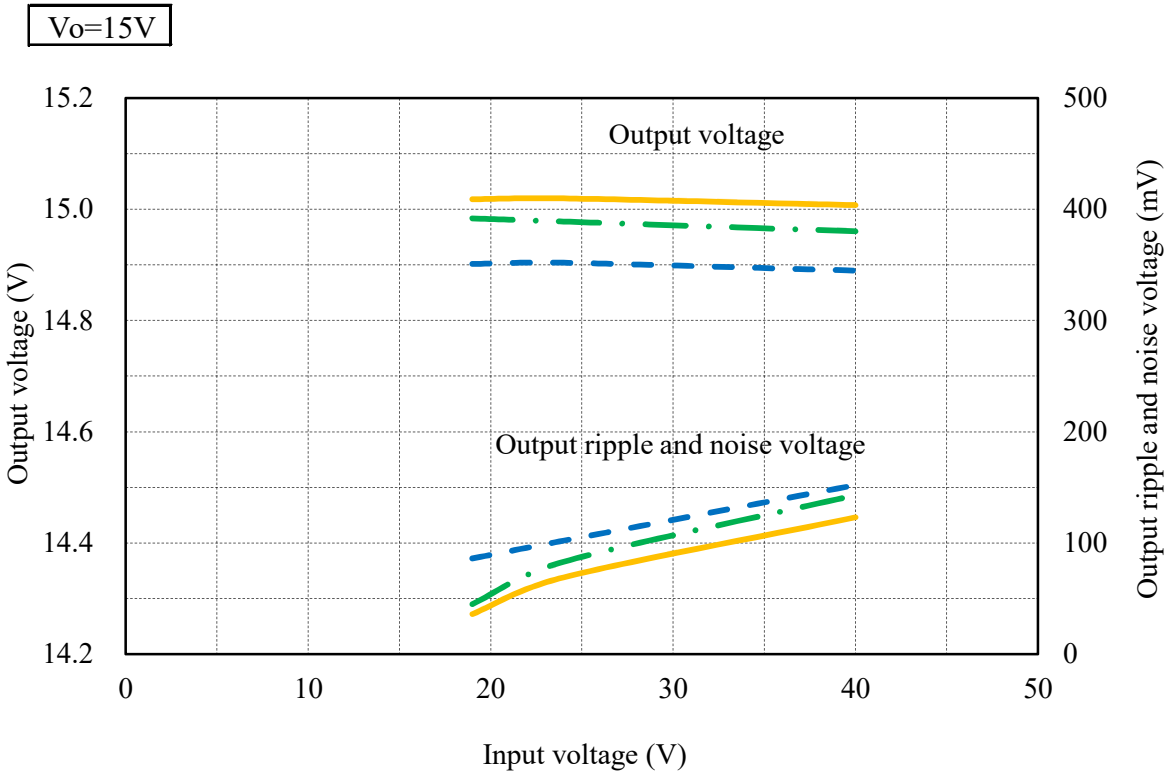
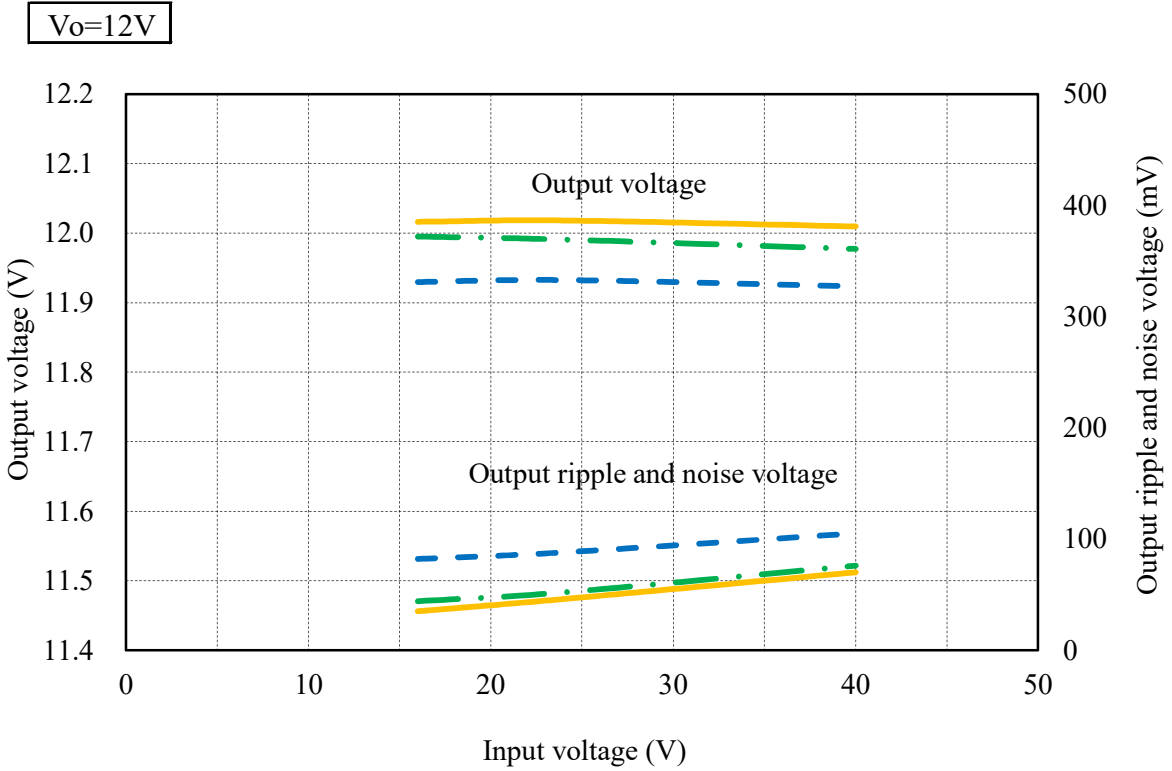
$V_o=5V$



(2) 出力電圧・出力リップルノイズ電圧 対 入力電圧

Output voltage and Output ripple and noise voltage vs. Input voltage

Conditions  $I_o$  : 100 %  
 $T_a$  : -40 °C — — — — —  
           : 25 °C - · - · - ·  
           : 85 °C —————



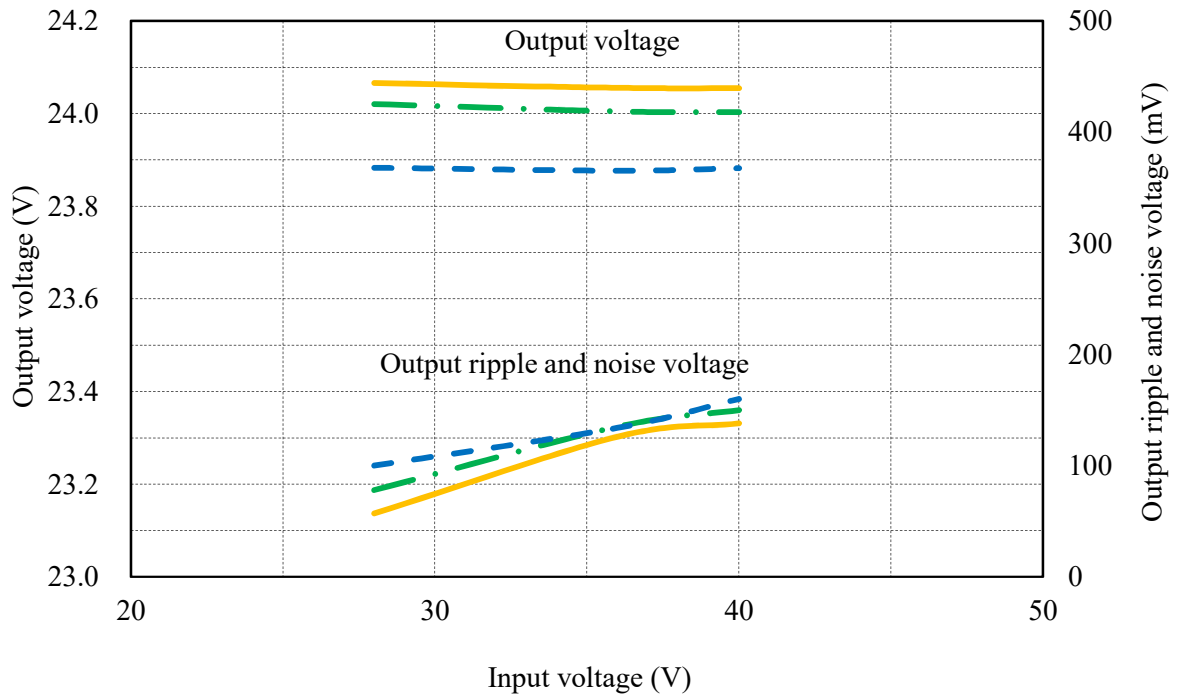


(2) 出力電圧・出力リップルノイズ電圧 対 入力電圧

Output voltage and Output ripple and noise voltage vs. Input voltage

Conditions Io : 100 %  
 Ta : -40 °C  
 : 25 °C  
 : 85 °C

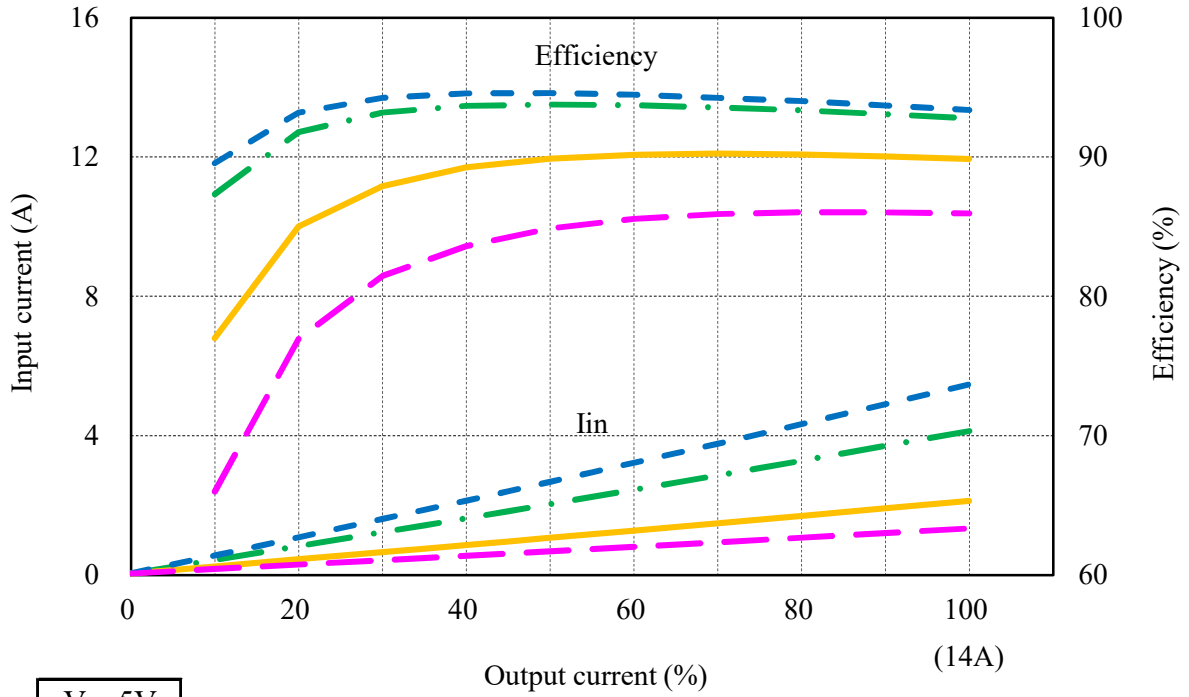
Vo=24V



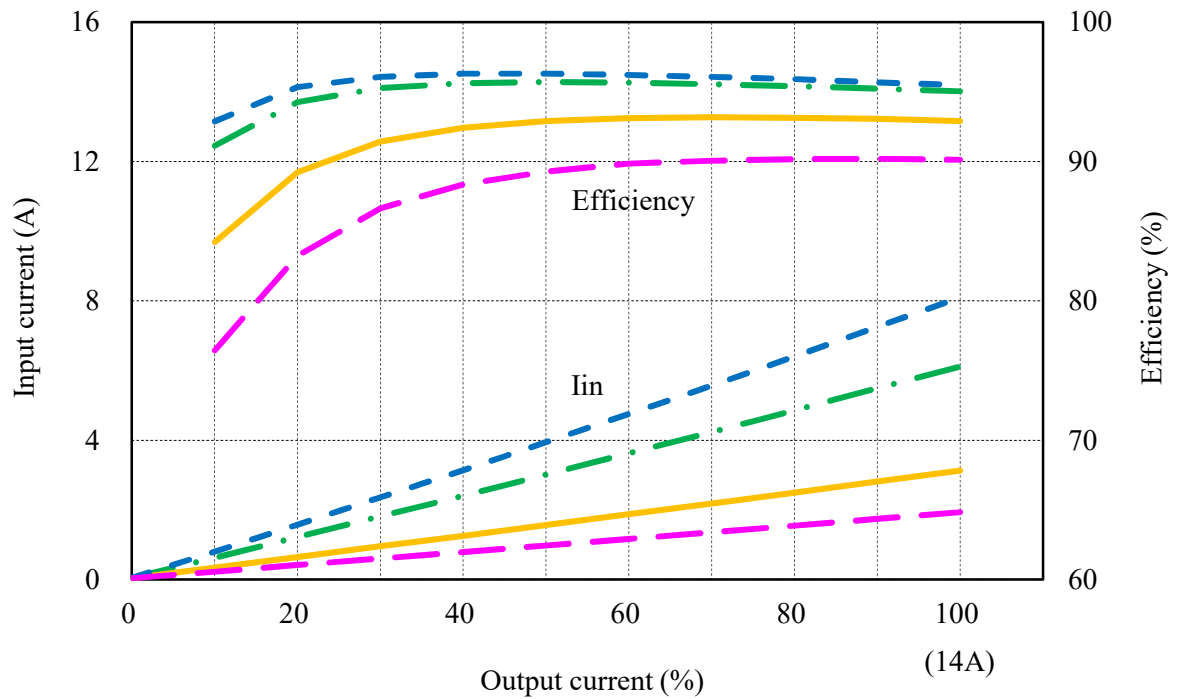
(3) 入力電流・効率 対 出力電流 Input current and Efficiency vs. Output current

Conditions Vin : 9 VDC — — —  
 : 12 VDC - · -  
 : 24 VDC ———  
 : 40 VDC - - -  
 Ta : 25 °C

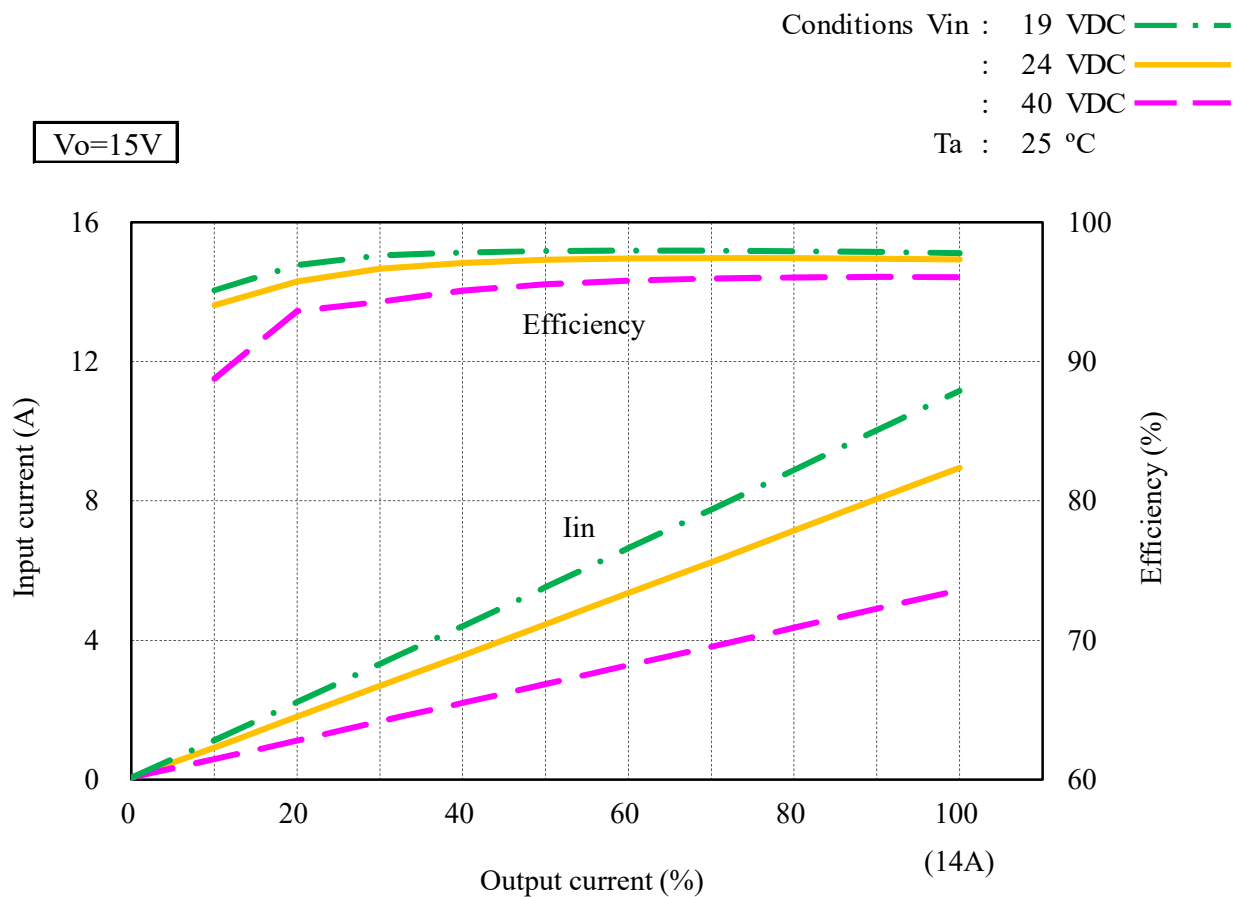
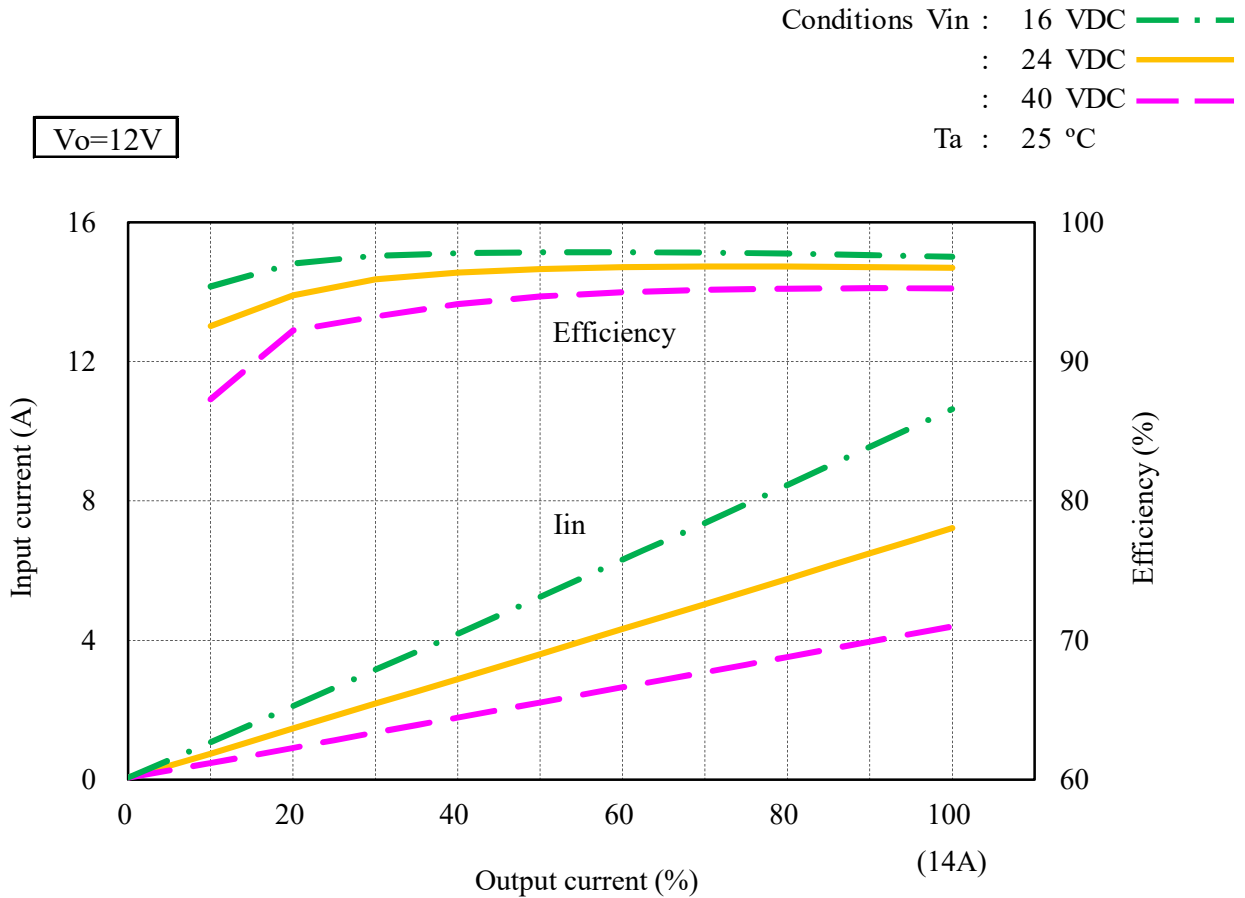
Vo=3.3V



Vo=5V



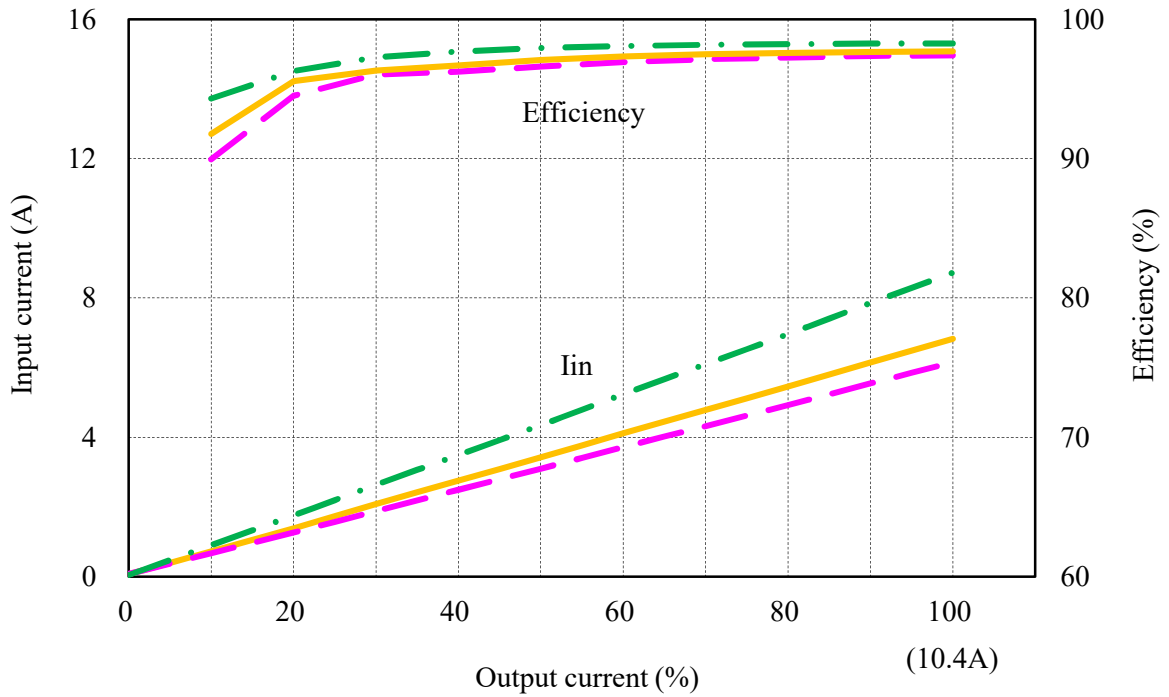
(3) 入力電流・効率 対 出力電流 Input current and Efficiency vs. Output current



(3) 入力電流・効率 対 出力電流 Input current and Efficiency vs. Output current

Conditions Vin : 28 VDC - . -  
 : 36 VDC —  
 : 40 VDC - - -  
 Ta : 25 °C

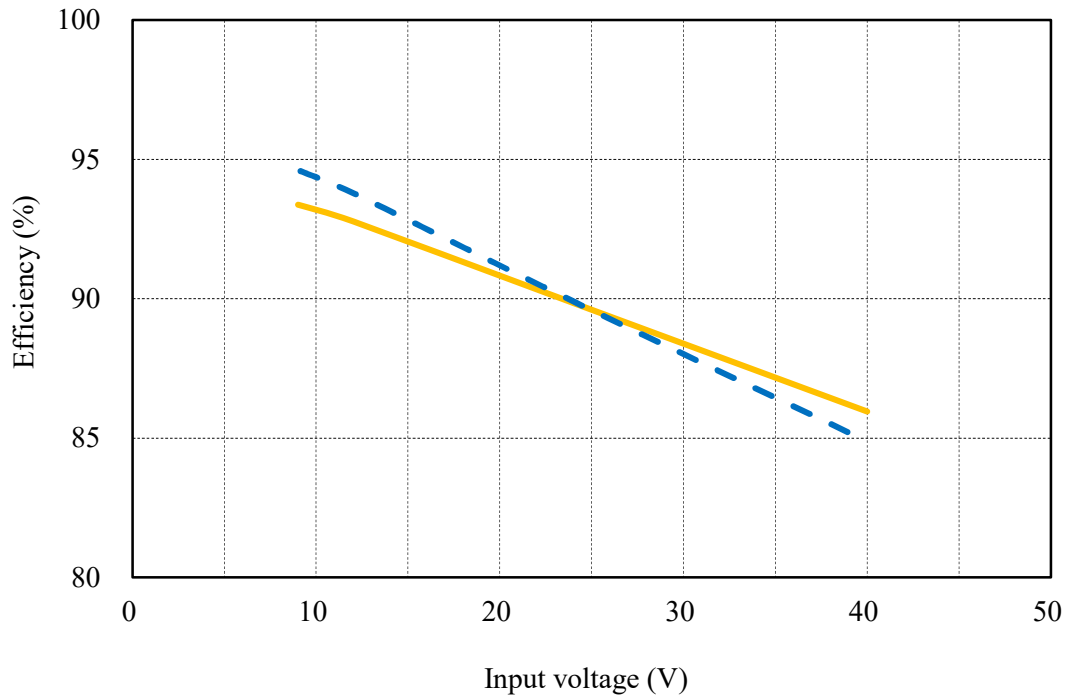
Vo=24V



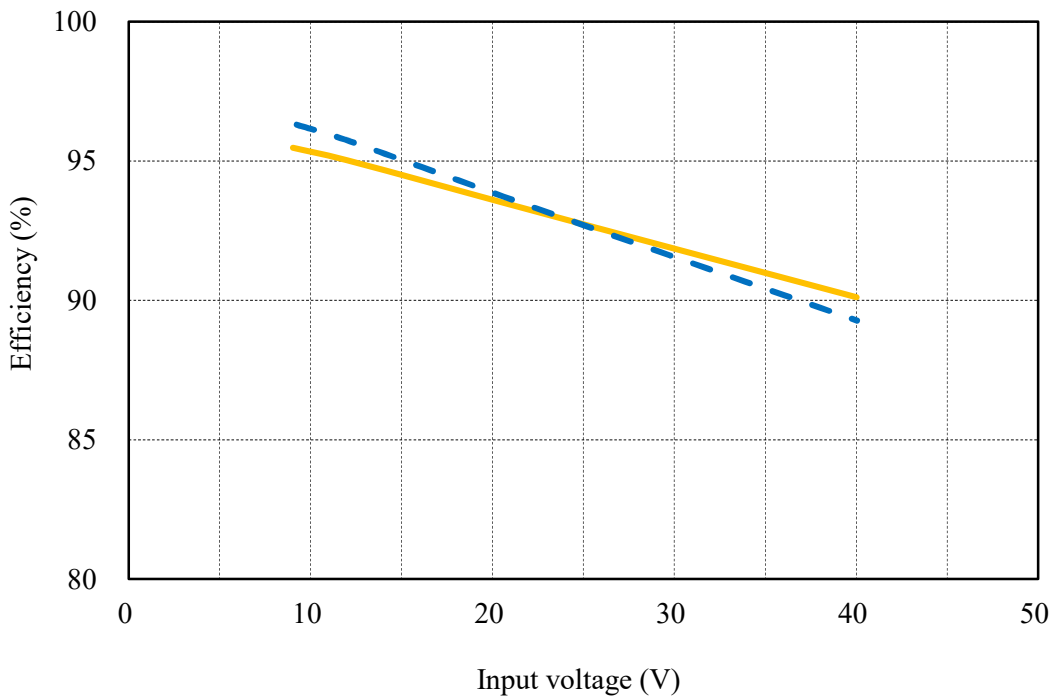
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

Conditions Io : 50 %    - - -  
              : 100 %    ———  
              Ta : 25 °C

Vo=3.3V

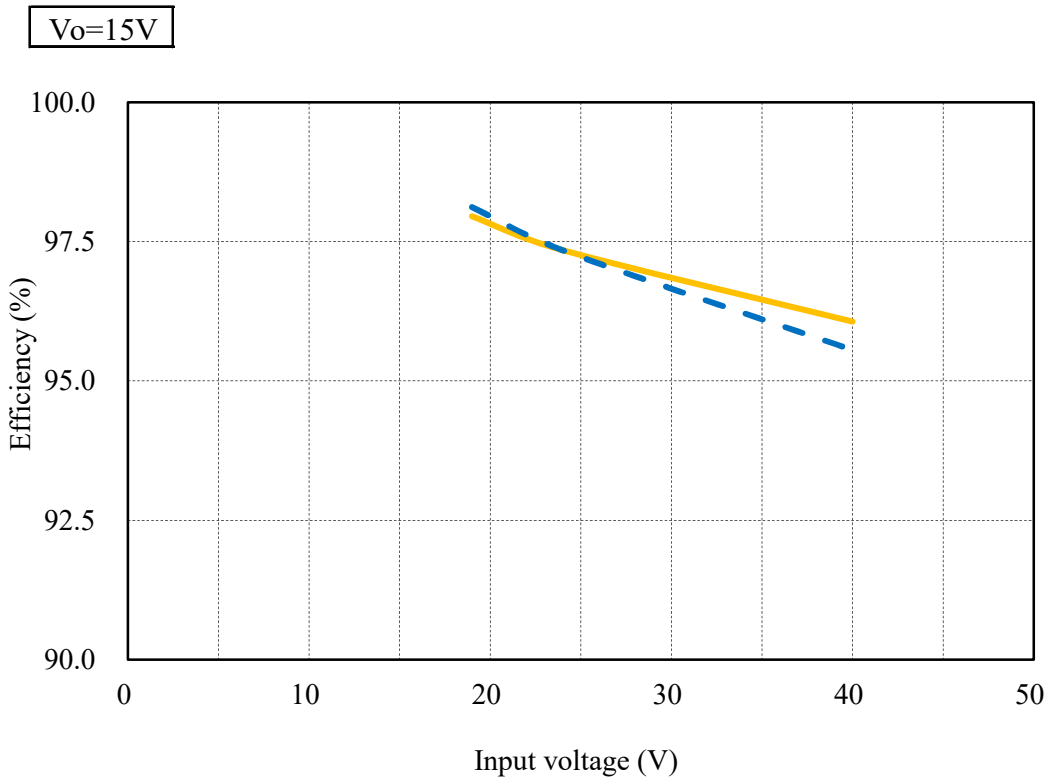
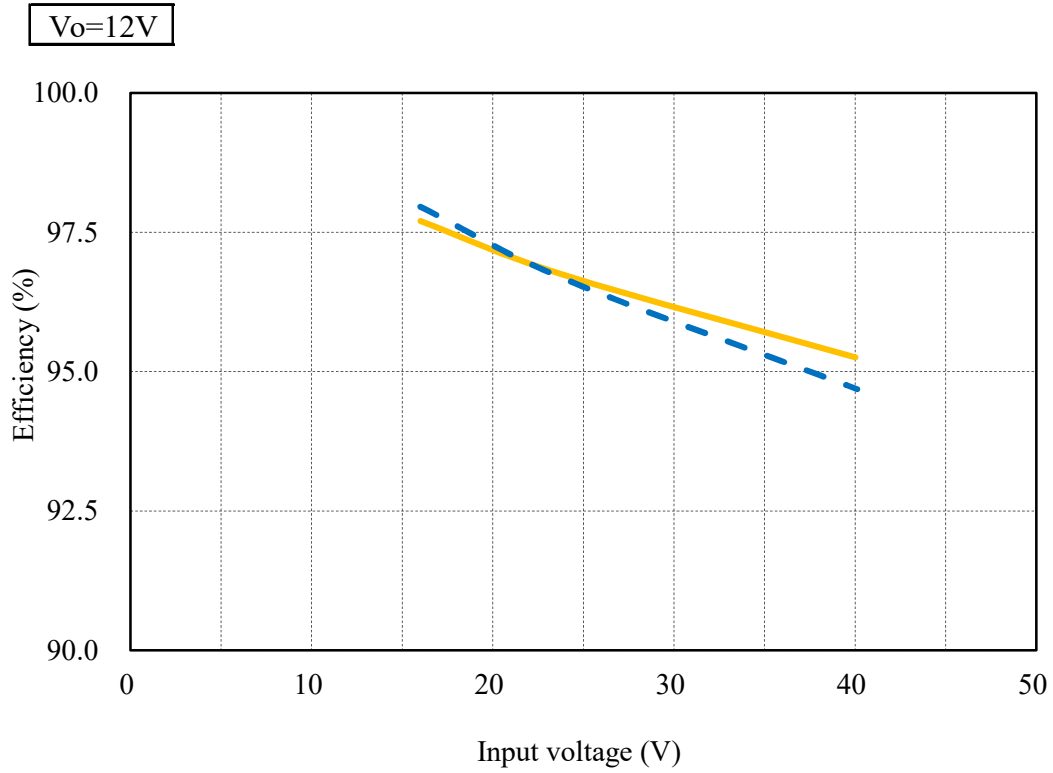


Vo=5V



(4) 効率 対 入力電圧 Efficiency vs. Input voltage

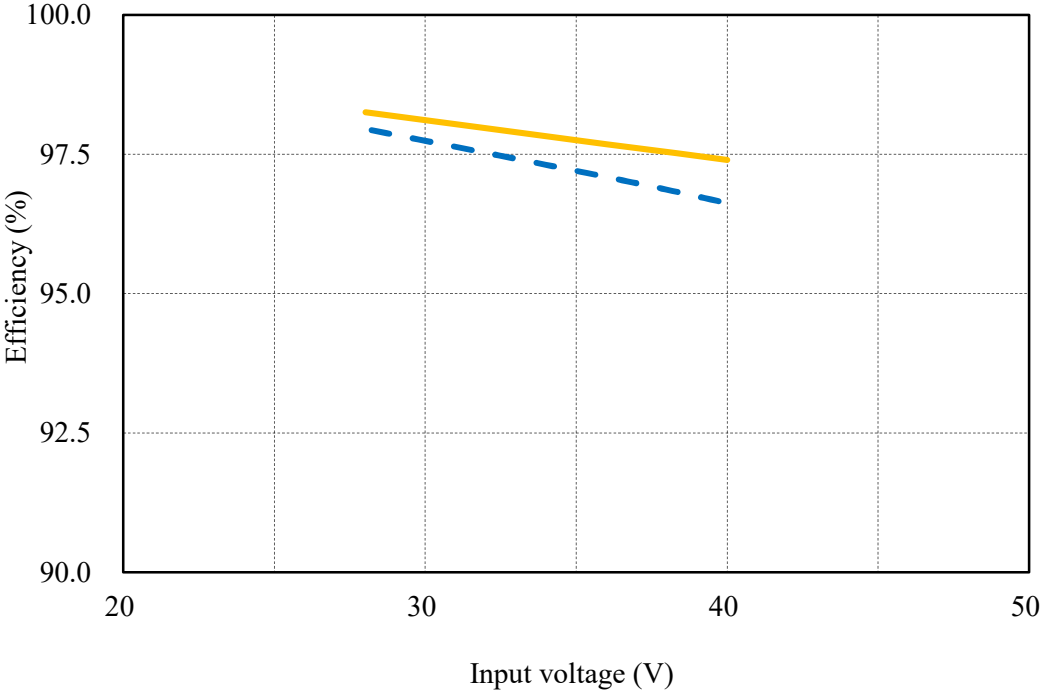
Conditions Io : 50 %    - - -  
                  : 100 %    ———  
                  Ta : 25 °C



(4) 効率 対 入力電圧 Efficiency vs. Input voltage

Conditions Io : 50 %    - - -  
              : 100 %    ———  
              Ta : 25 °C

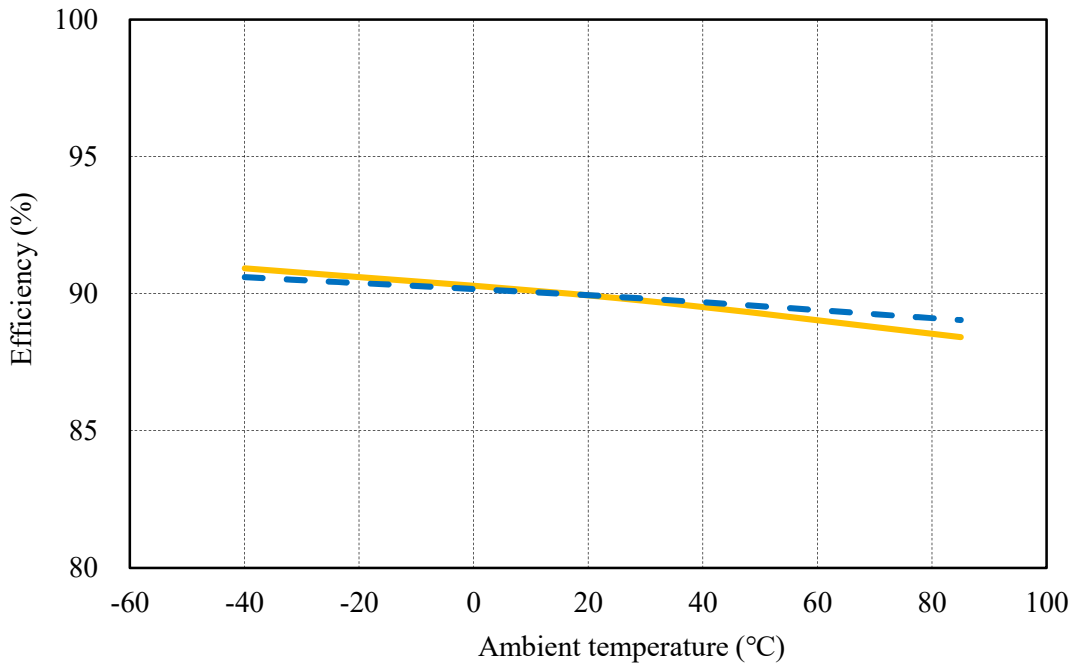
Vo=24V



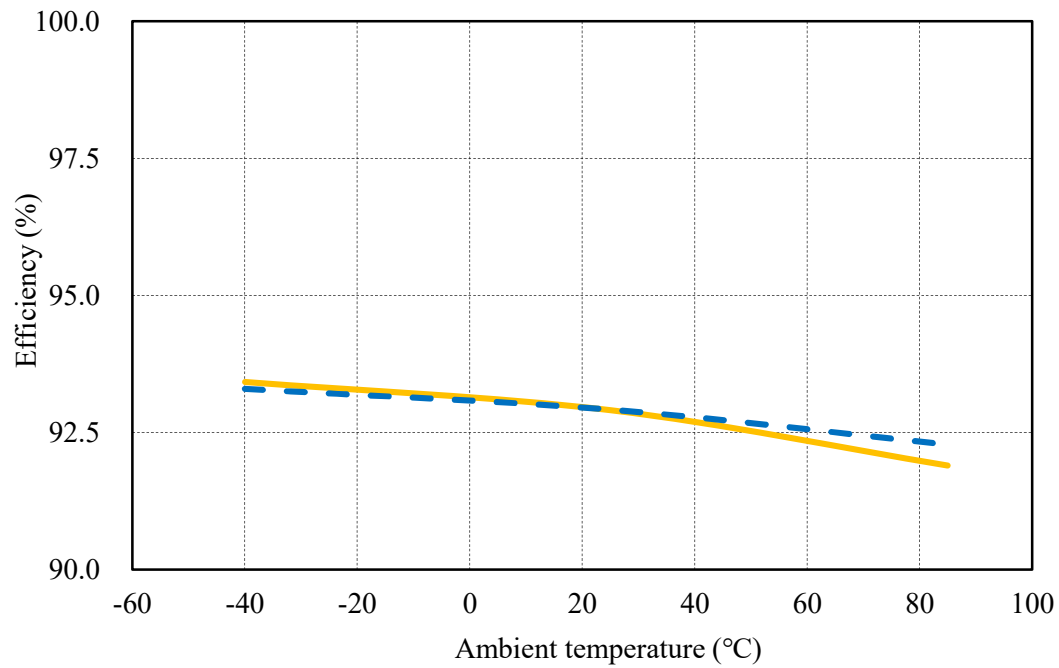
(5) 効率 対 温度 Efficiency vs. Temperature

Conditions Vin : 24 V  
Io : 50 %    - - -  
          : 100 %    ———

Vo=3.3V



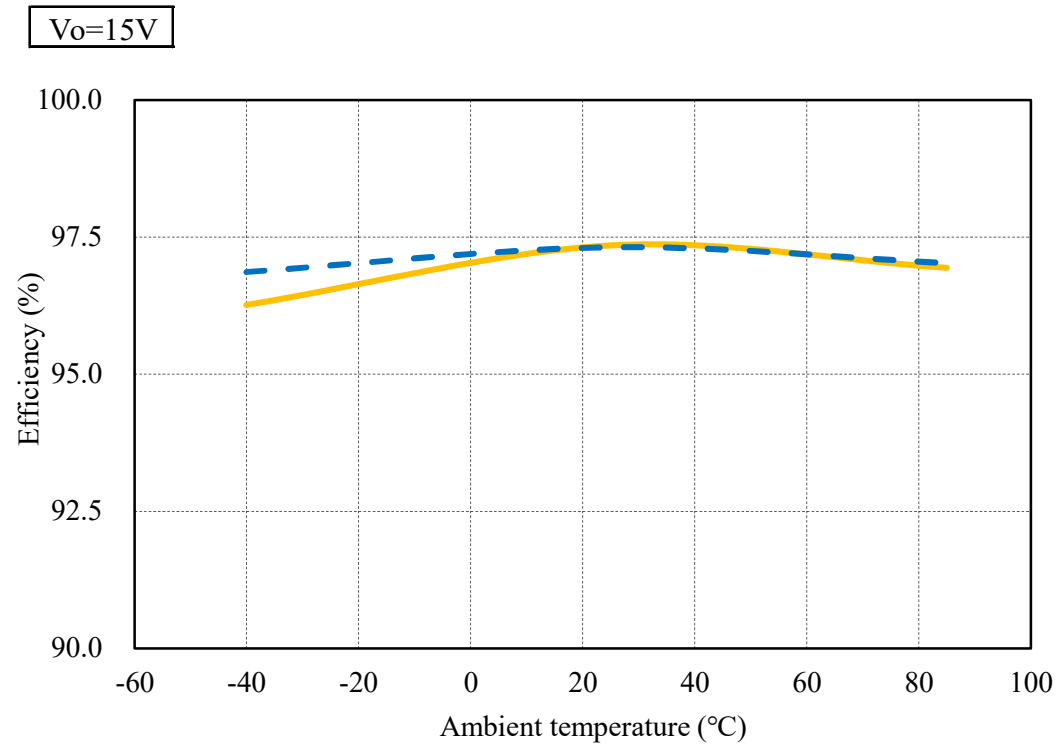
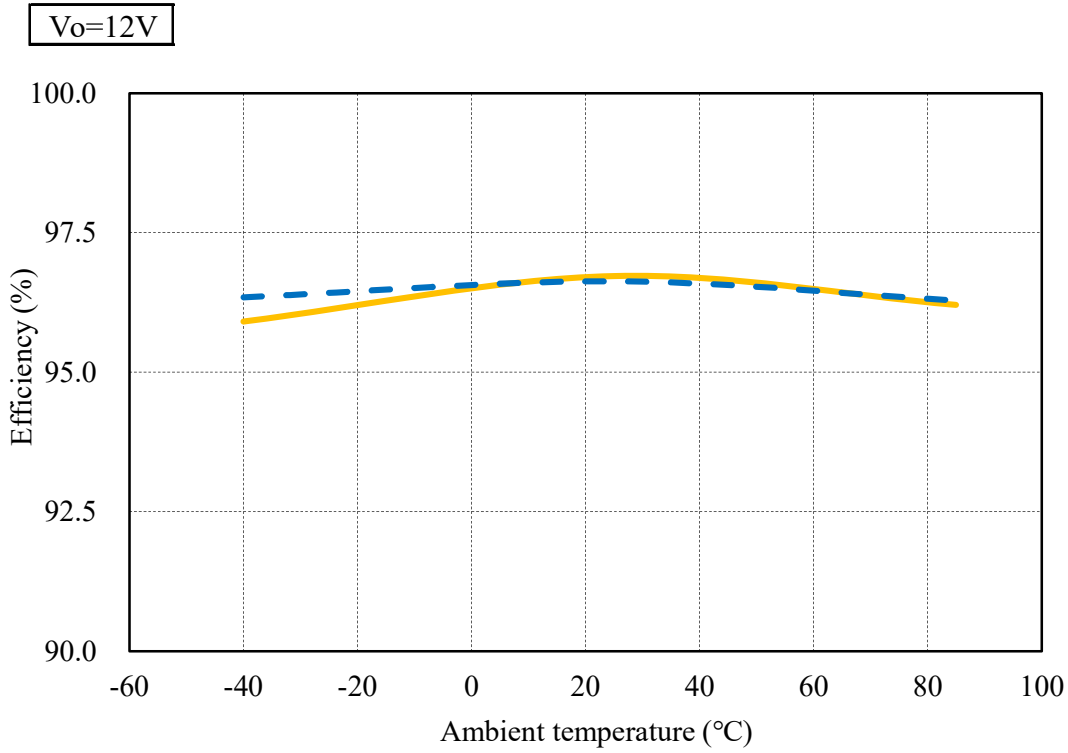
Vo=5V





(5) 効率対温度 Efficiency vs. Temperature

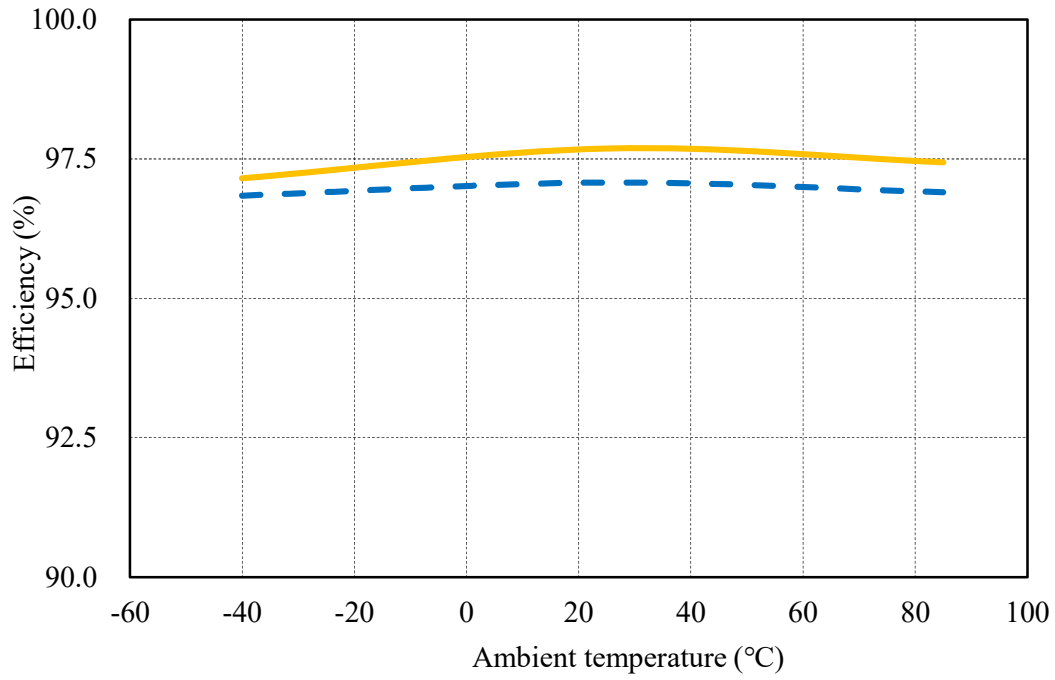
Conditions Vin : 24 V  
Io : 50 %    - - -  
          : 100 %    ———



(5) 效率对温度 Efficiency vs. Temperature

Conditions Vin : 36 V  
Io : 50 %    - - -  
          : 100 %    ———

Vo=24V



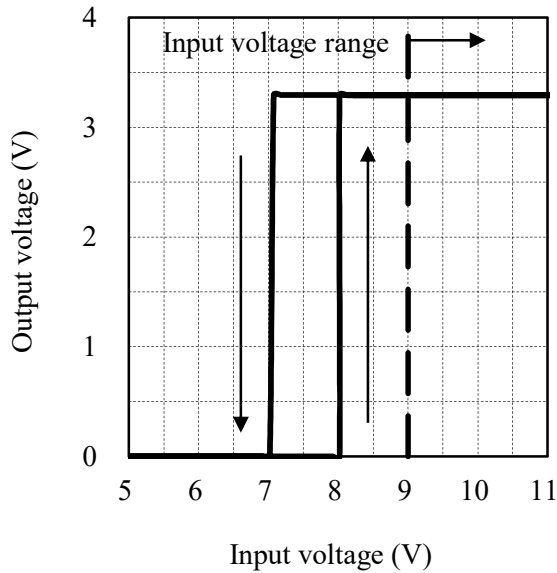
(6) 起動・遮断電圧特性 Start up and Drop out voltage characteristics

出力電圧 対 入力電圧

Output voltage vs. Input voltage

Conditions  $I_o : 100\%$   
 $T_a : 25\text{ }^\circ\text{C}$

$V_o=3.3\text{V}$

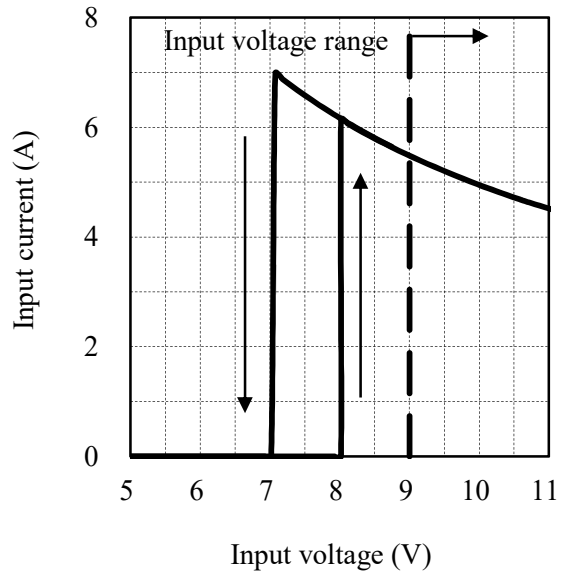


入力電流 対 入力電圧

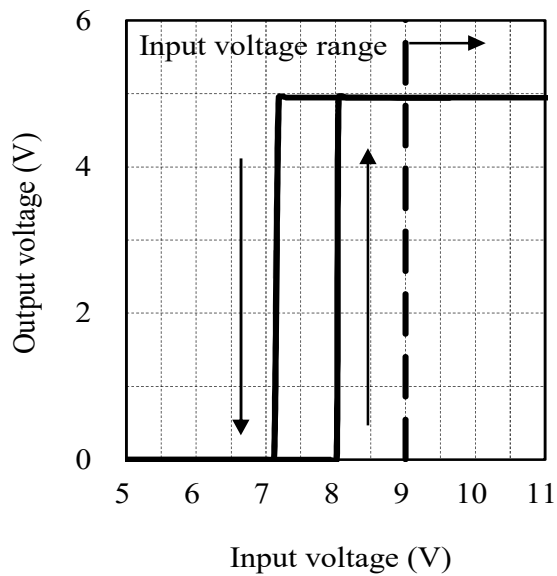
Input current vs. Input voltage

Conditions  $I_o : 100\%$   
 $T_a : 25\text{ }^\circ\text{C}$

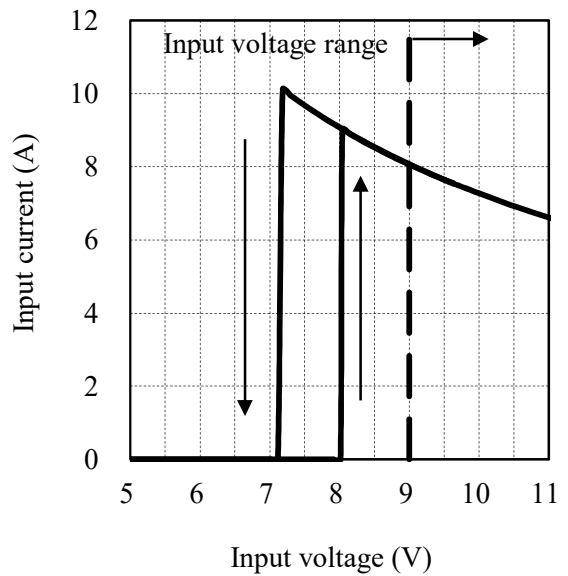
$V_o=3.3\text{V}$



$V_o=5\text{V}$



$V_o=5\text{V}$



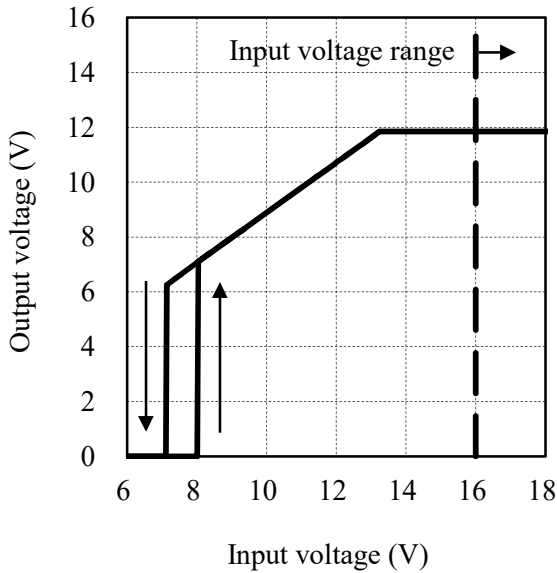
(6) 起動・遮断電圧特性 Start up and Drop out voltage characteristics

出力電圧 対 入力電圧

Output voltage vs. Input voltage

Conditions  $I_o$  : 100 %  
 $T_a$  : 25 °C

$V_o=12V$

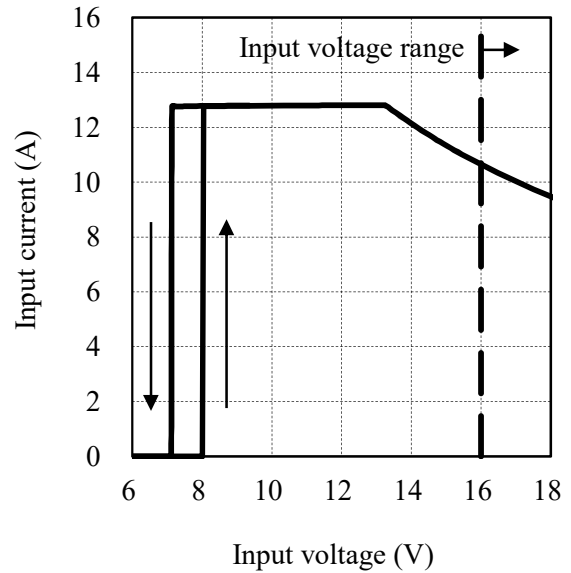


入力電流 対 入力電圧

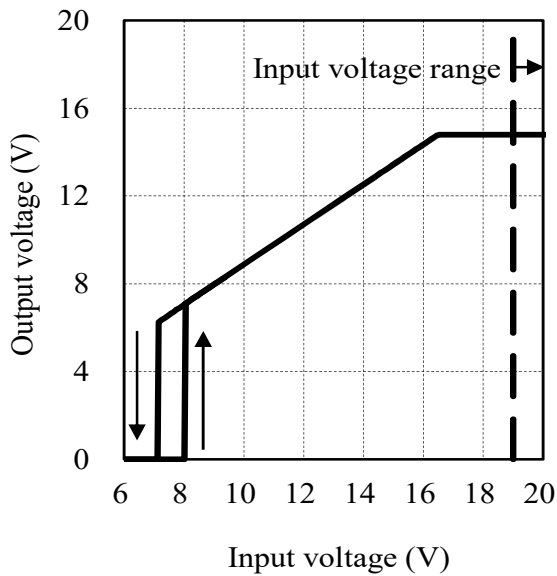
Input current vs. Input voltage

Conditions  $I_o$  : 100 %  
 $T_a$  : 25 °C

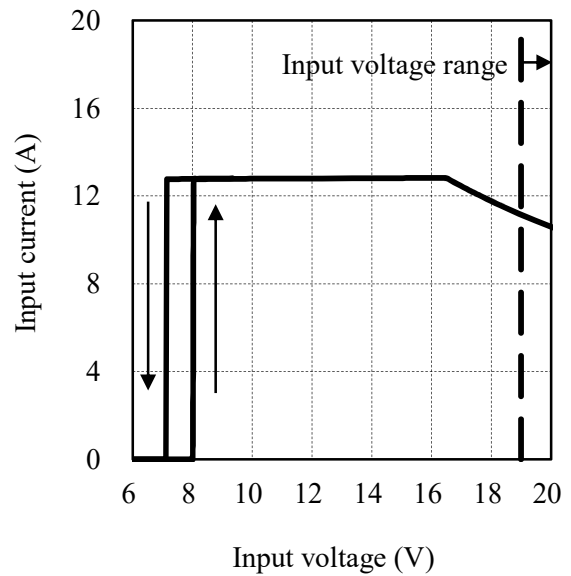
$V_o=12V$



$V_o=15V$



$V_o=15V$



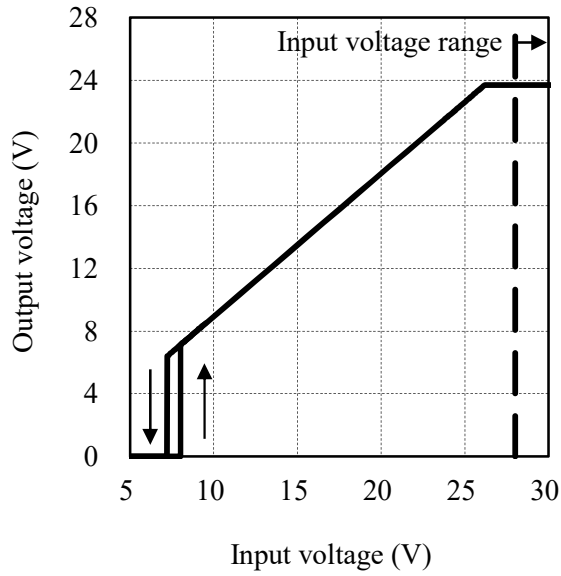
(6) 起動・遮断電圧特性 Start up and Drop out voltage characteristics

出力電圧 対 入力電圧

Output voltage vs. Input voltage

Conditions  $I_o$  : 100 %  
 $T_a$  : 25 °C

$V_o=24V$

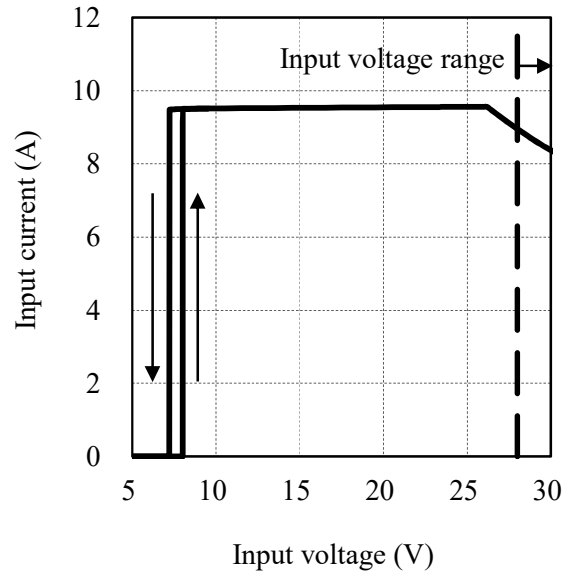


入力電流 対 入力電圧

Input current vs. Input voltage

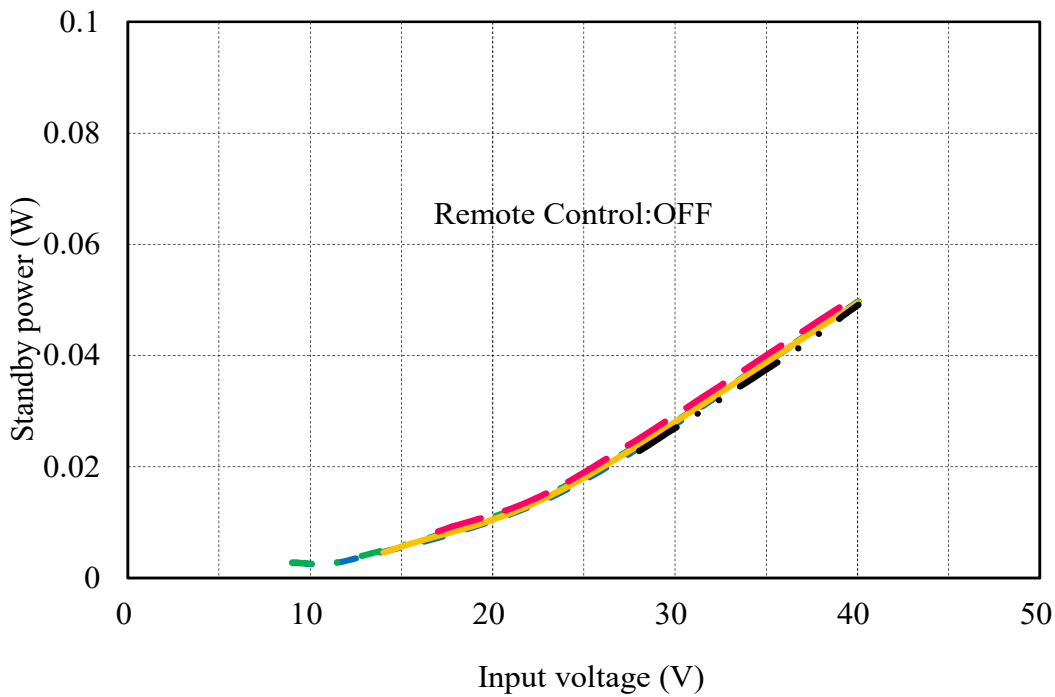
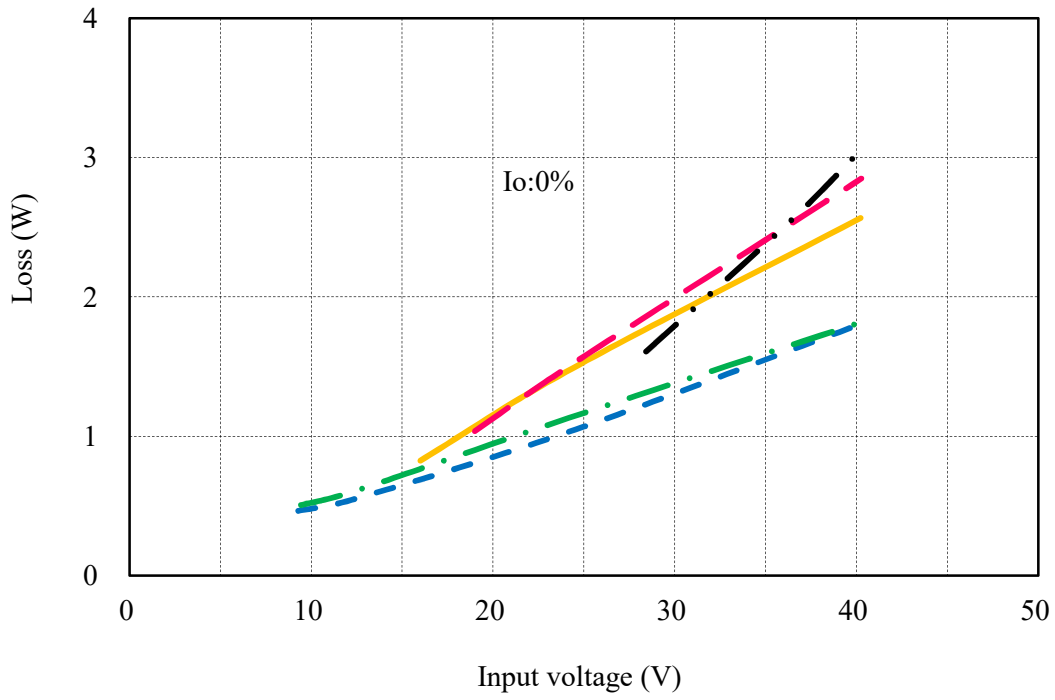
Conditions  $I_o$  : 100 %  
 $T_a$  : 25 °C

$V_o=24V$



2-2. 待機電力特性 Standby power characteristics

Conditions Vo : 3.3 VDC — — —  
 : 5 VDC - . -  
 : 12 VDC — — —  
 : 15 VDC — — —  
 : 24 VDC — . .  
 Ta : 25 °C



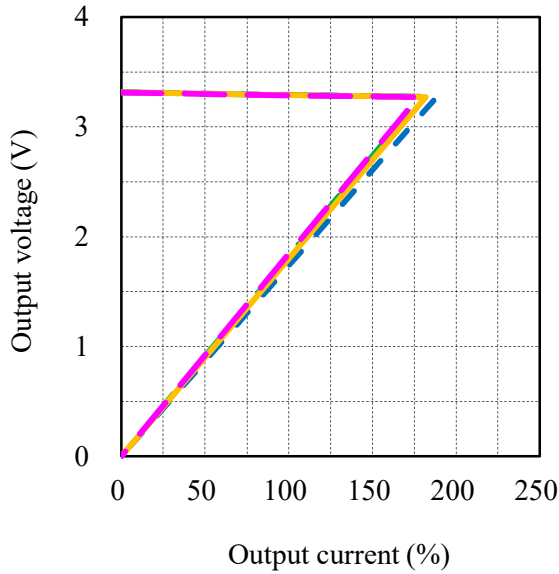
2-3. 過電流保護特性 Over current protection (OCP) characteristics

入力電圧依存性

Input voltage dependence

Conditions Vin : 9 VDC — — — —  
 : 12 VDC — · — · —  
 : 24 VDC — — — —  
 : 40 VDC — — — —  
 Ta : 25 °C

Vo=3.3V

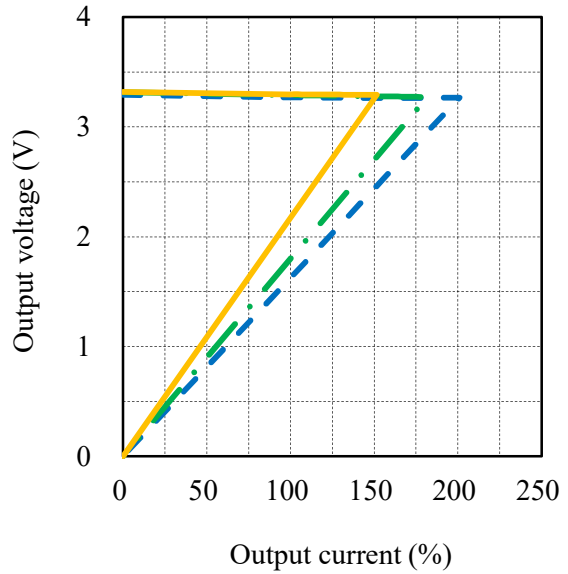


周囲温度依存性

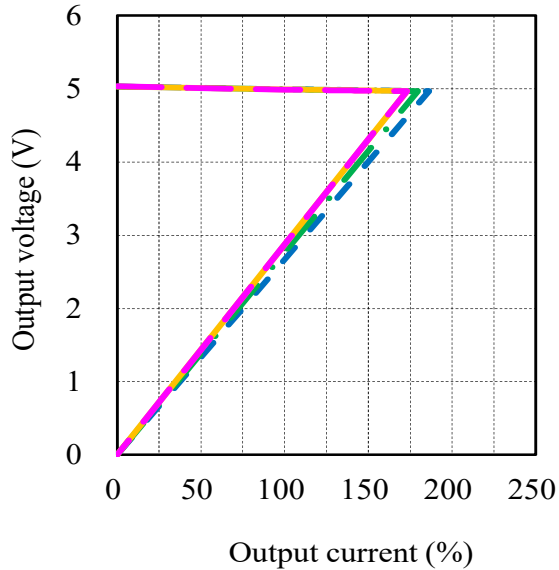
Ambient temperature dependence

Conditions Vin : 24 VDC  
 Ta : -40 °C — — — —  
 : 25 °C — · — · —  
 : 85 °C — — — —

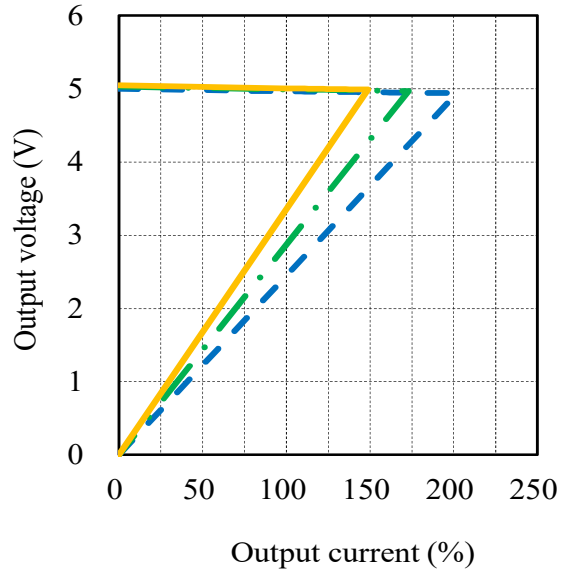
Vo=3.3V



Vo=5V



Vo=5V



2-3. 過電流保護特性 Over current protection (OCP) characteristics

入力電圧依存性

Input voltage dependence

Conditions Vin : 16 VDC ———  
 : 24 VDC ———  
 : 40 VDC ———  
 Ta : 25 °C

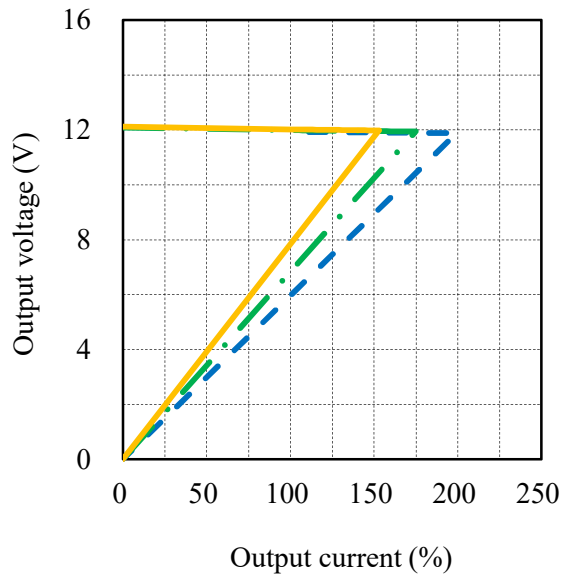
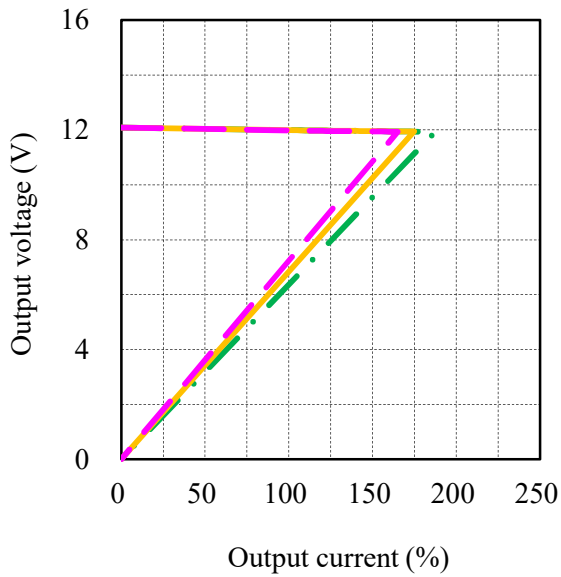
周囲温度依存性

Ambient temperature dependence

Conditions Vin : 24 VDC  
 Ta : -40 °C - - - -  
 : 25 °C ———  
 : 85 °C ———

Vo=12V

Vo=12V

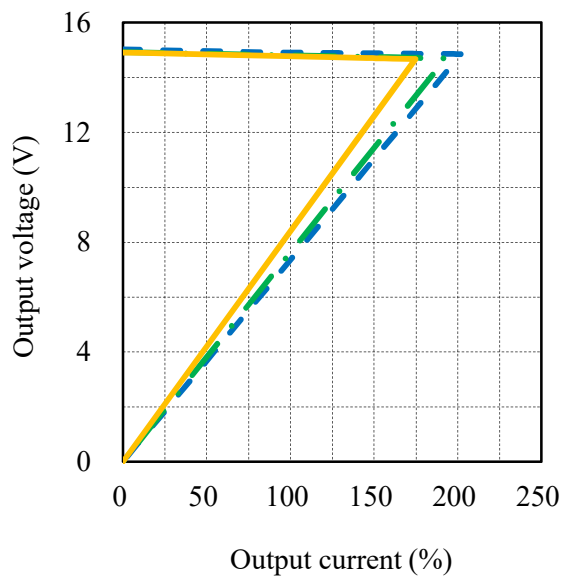
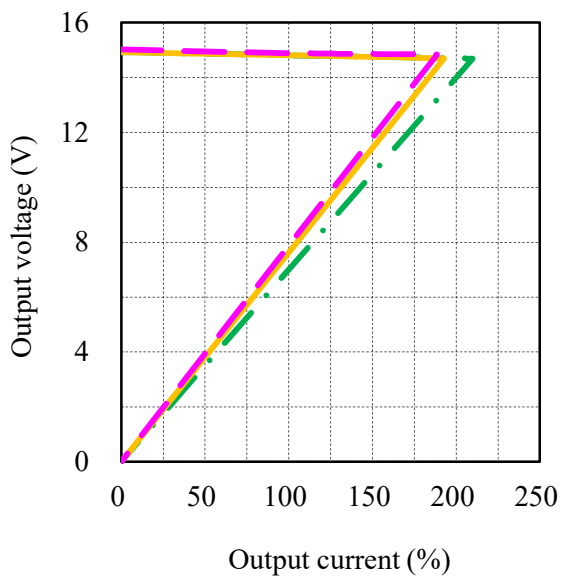


Conditions Vin : 19 VDC ———  
 : 24 VDC ———  
 : 40 VDC ———  
 Ta : 25 °C

Conditions Vin : 24 VDC  
 Ta : -40 °C - - - -  
 : 25 °C ———  
 : 85 °C ———

Vo=15V

Vo=15V





2-3. 過電流保護特性 Over current protection (OCP) characteristics

入力電圧依存性

Input voltage dependence

Conditions Vin : 28 VDC —●—  
 : 36 VDC —■—  
 : 40 VDC —▲—  
 Ta : 25 °C

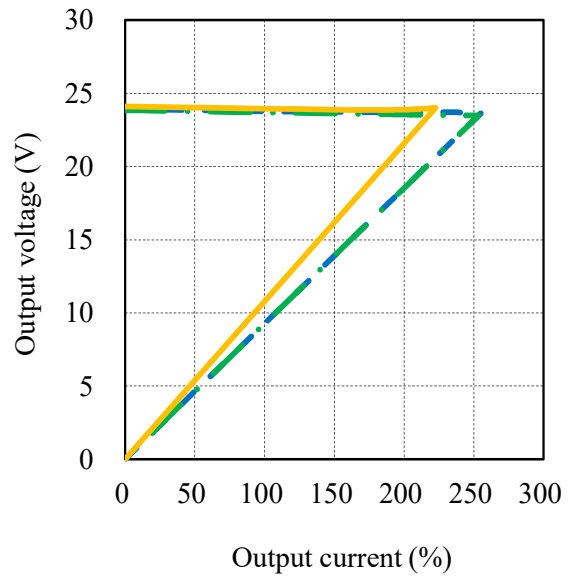
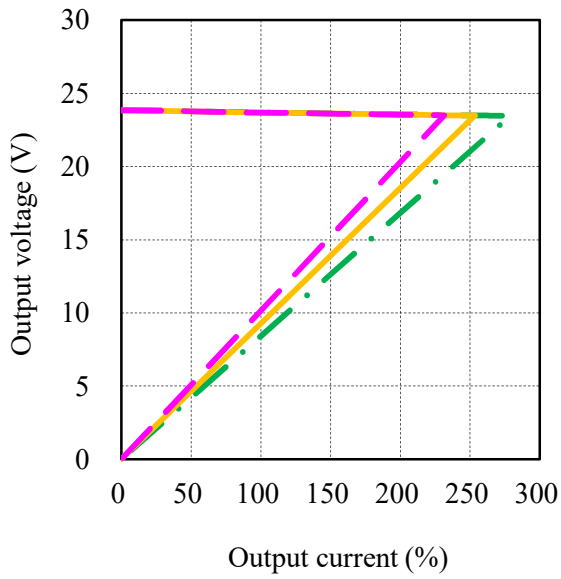
周囲温度依存性

Ambient temperature dependence

Conditions Vin : 24 VDC  
 Ta : -40 °C —■—  
 : 25 °C —●—  
 : 85 °C —■—

Vo=24V

Vo=24V



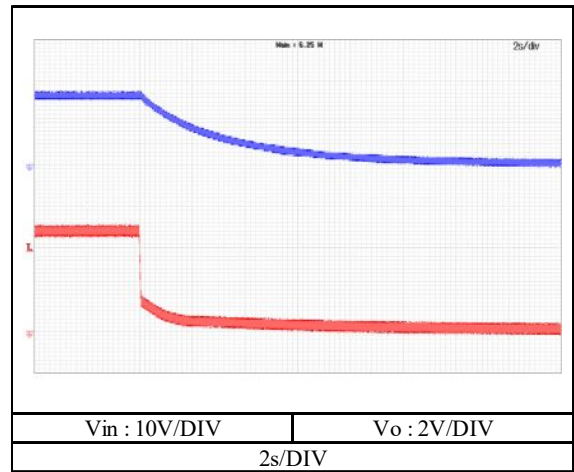
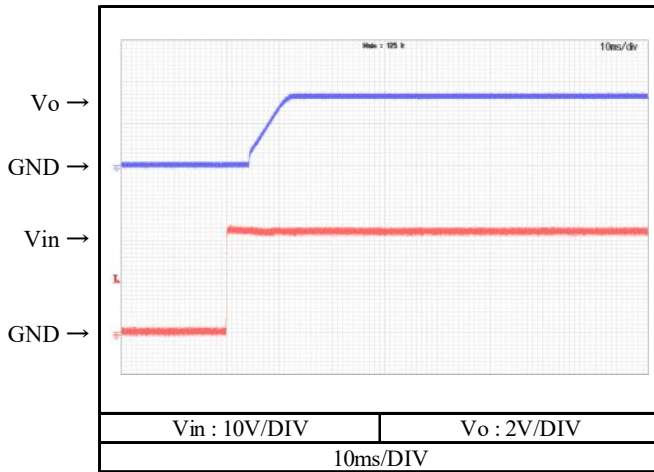
2-4. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions  $V_{in}$  : 24 VDC

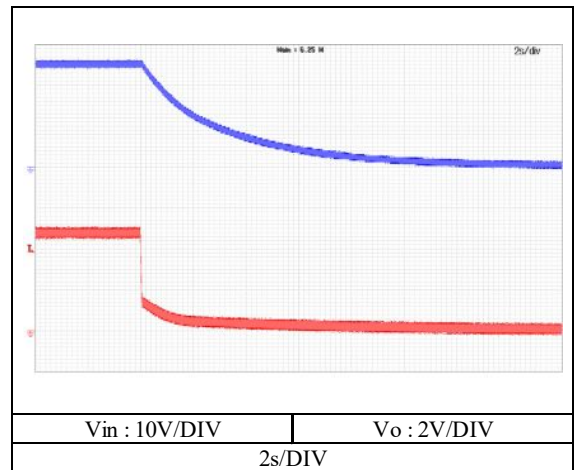
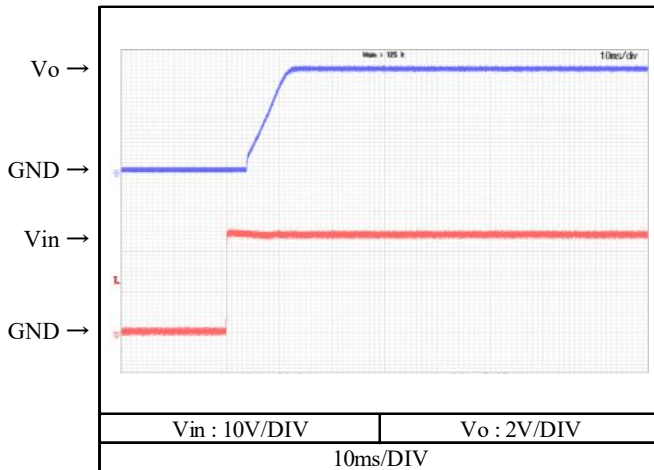
$I_o$  : 0 %

$T_a$  : 25 °C

$V_o=3.3V$



$V_o=5V$



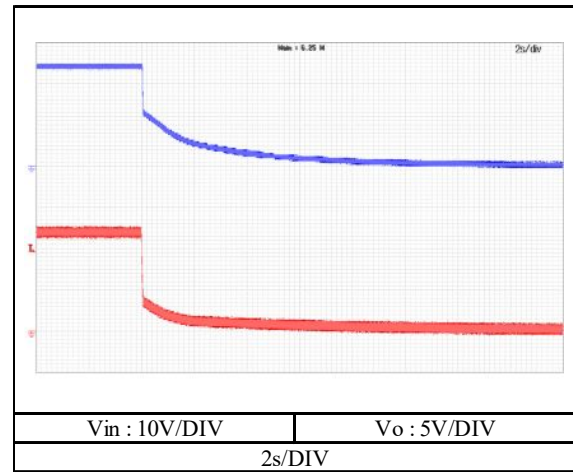
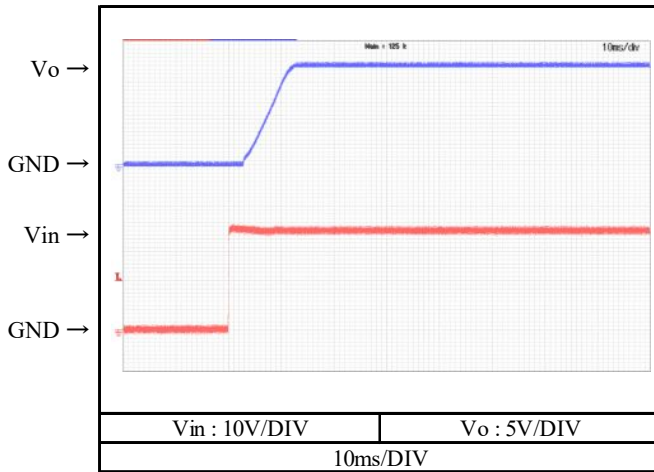
2-4. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 24 VDC

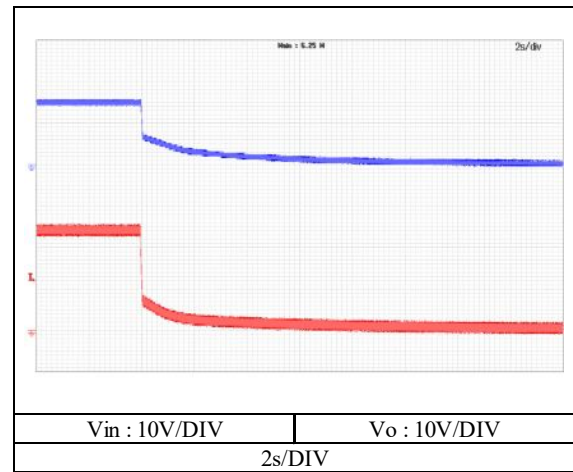
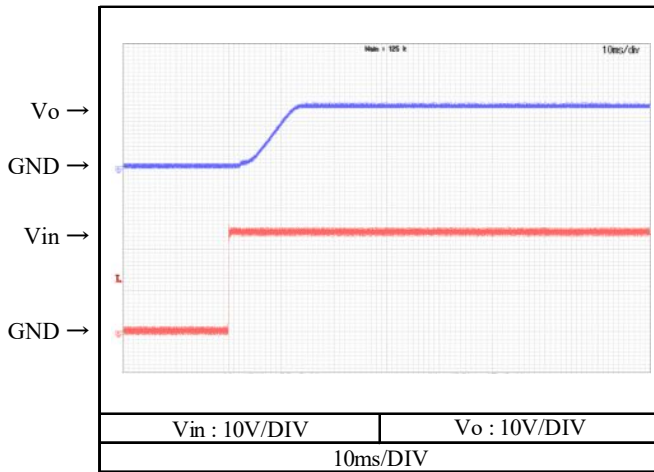
Io : 0 %

Ta : 25 °C

Vo=12V



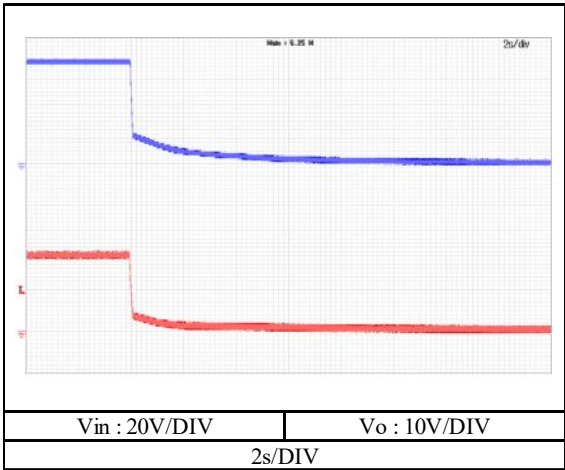
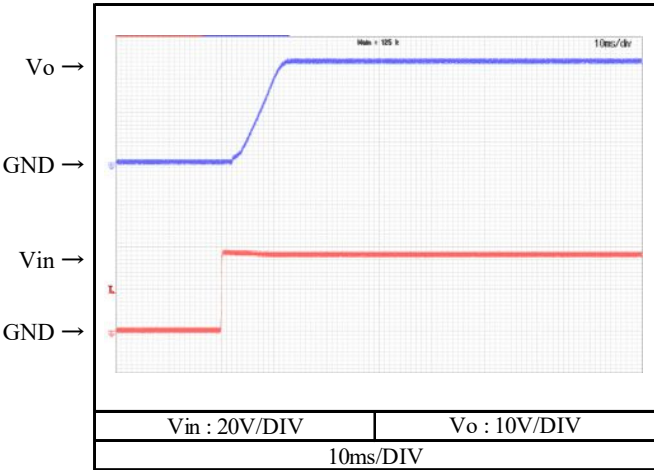
Vo=15V



2-4. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 36 VDC  
Io : 0 %  
Ta : 25 °C

Vo=24V



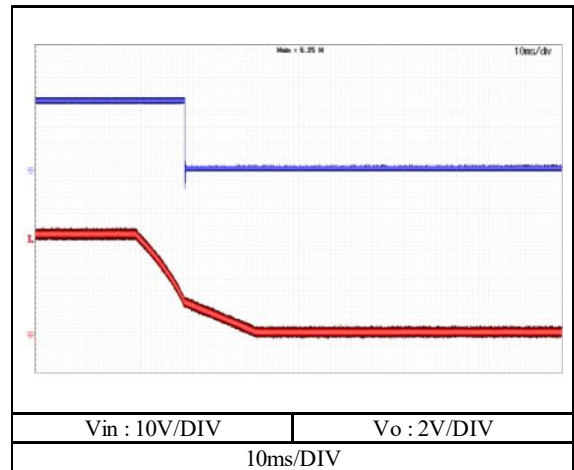
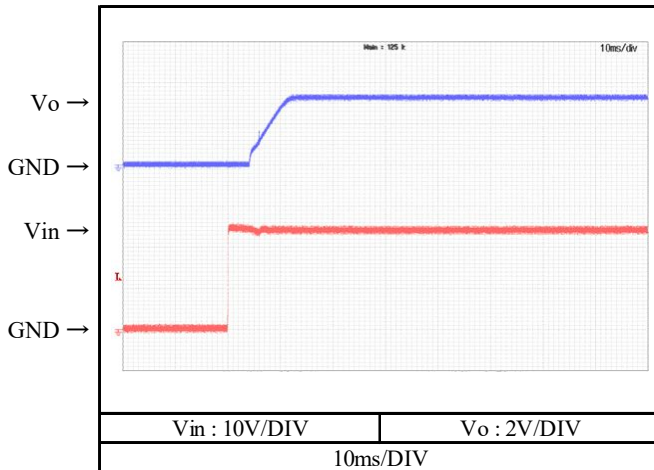
2-4. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions  $V_{in}$  : 24 VDC

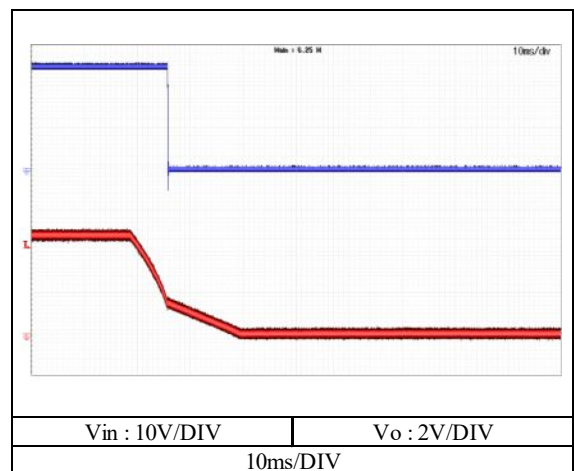
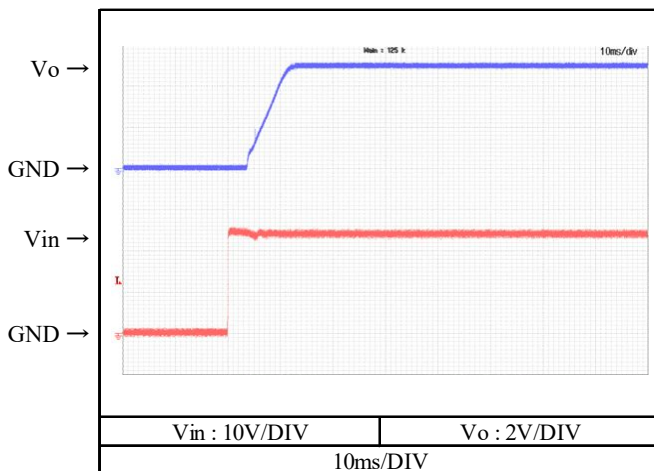
$I_o$  : 100 %

$T_a$  : 25 °C

$V_o=3.3V$



$V_o=5V$



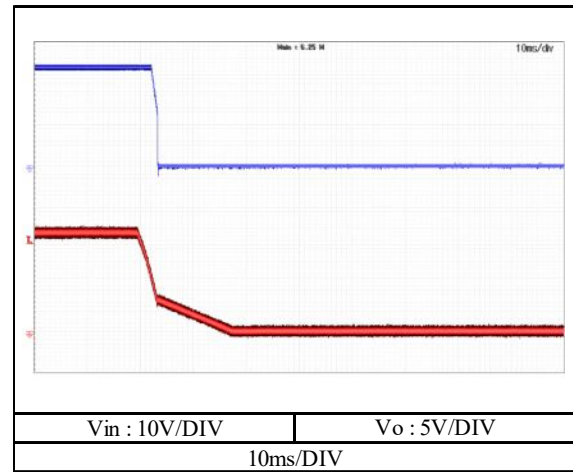
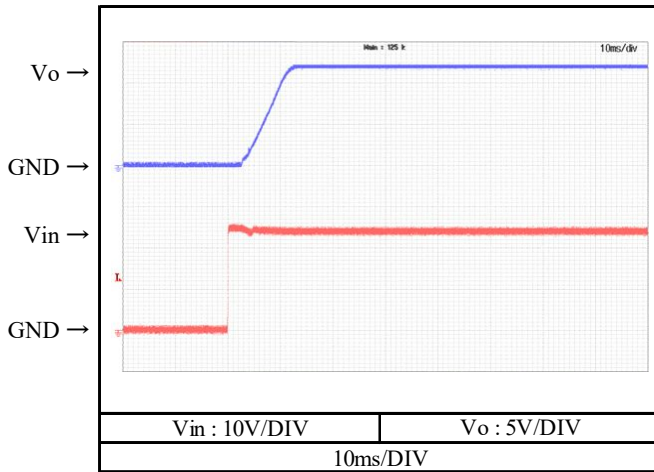
2-4. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 24 VDC

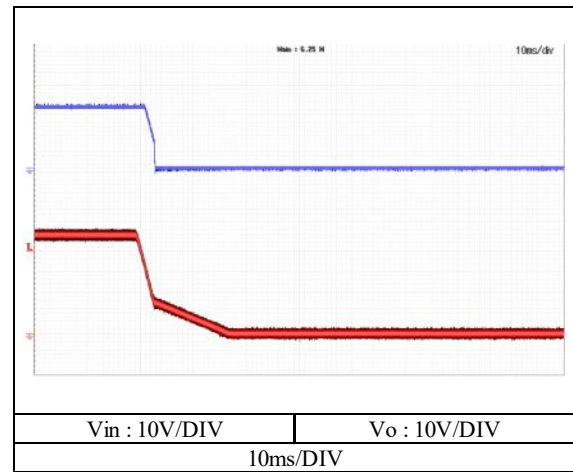
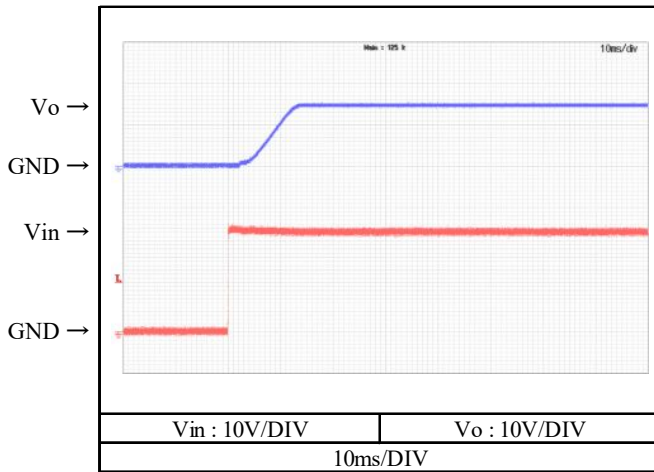
Io : 100 %

Ta : 25 °C

Vo=12V



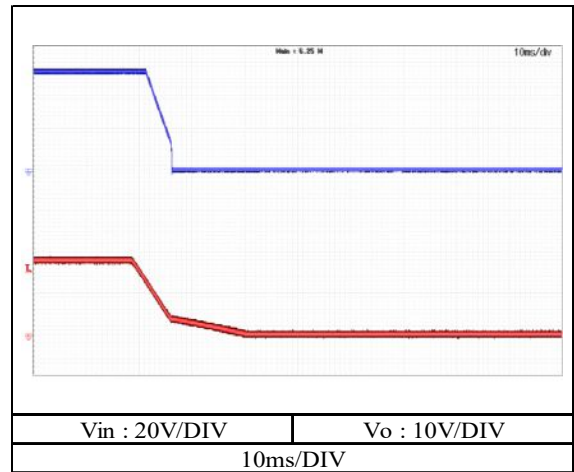
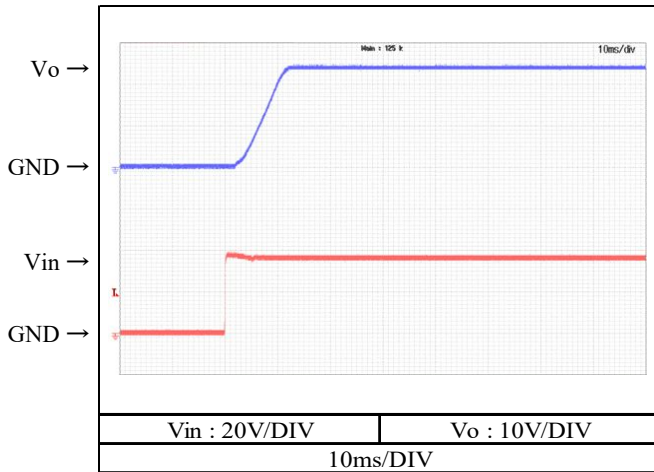
Vo=15V



2-4. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 36 VDC  
Io : 100 %  
Ta : 25 °C

Vo=24V



2-4. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

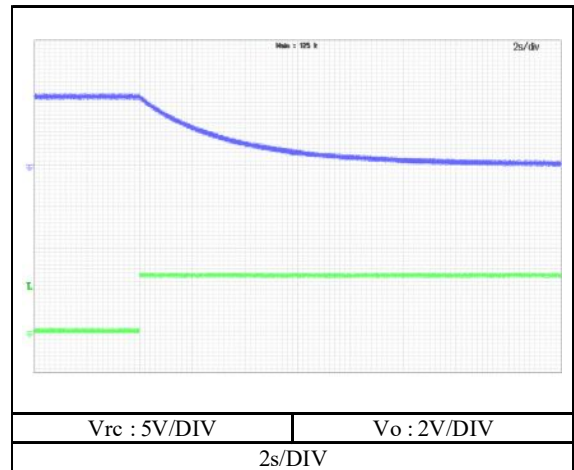
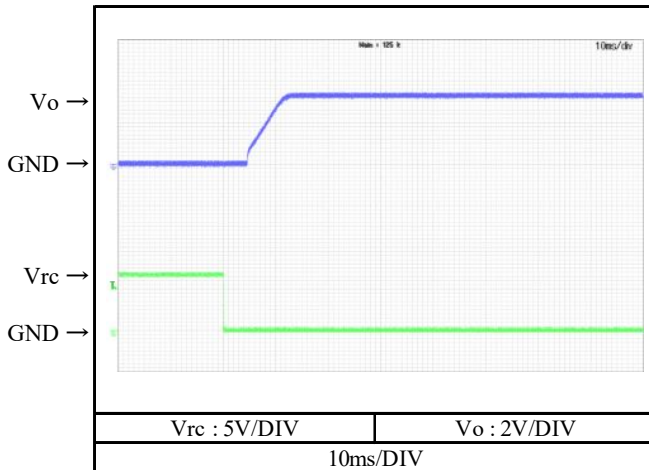
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions  $V_{in}$  : 24 VDC

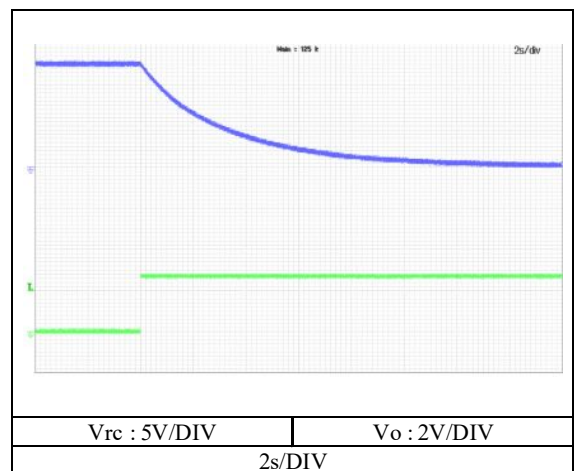
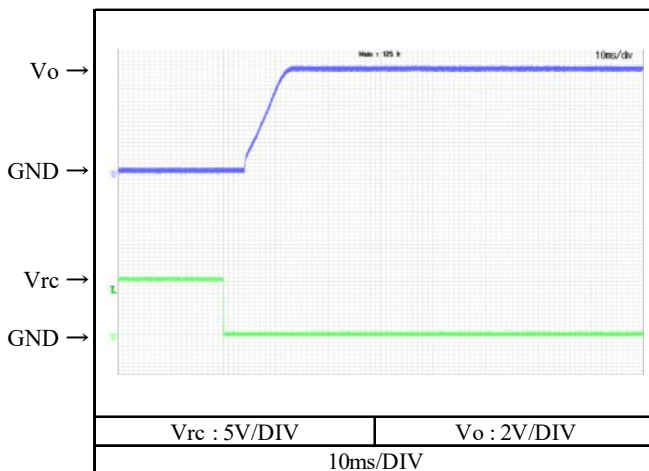
$I_o$  : 0 %

$T_a$  : 25 °C

$V_o=3.3V$



$V_o=5V$





2-4. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

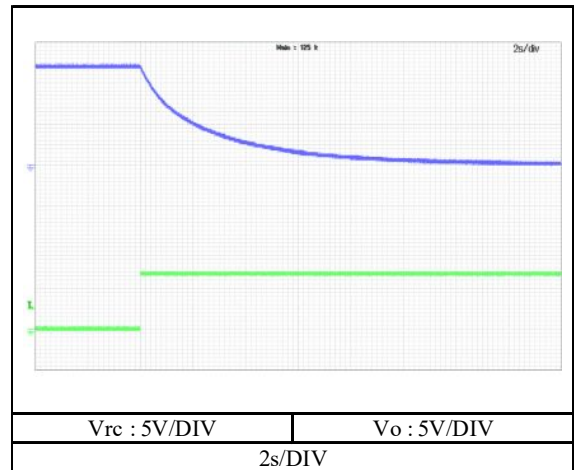
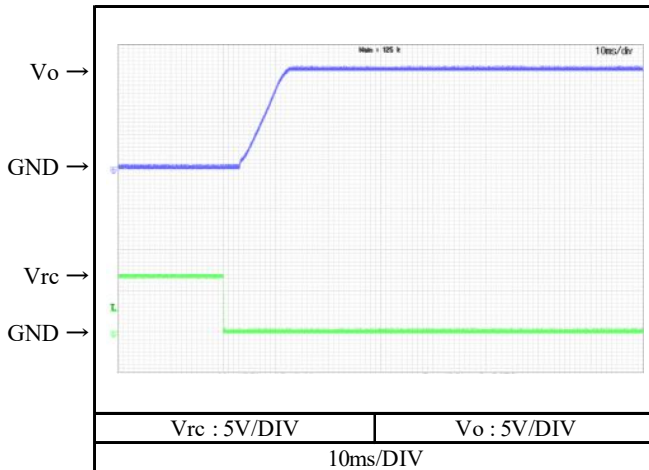
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions  $V_{in}$  : 24 VDC

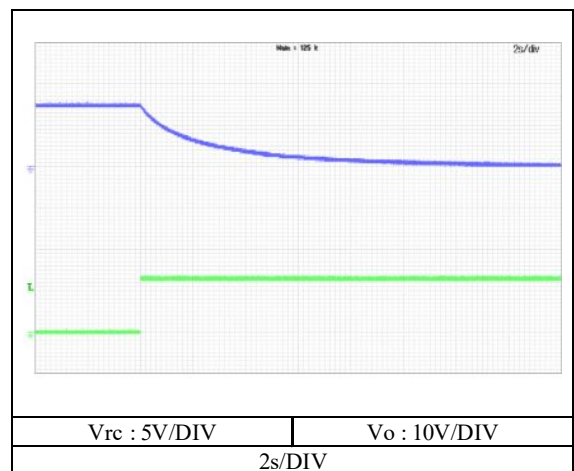
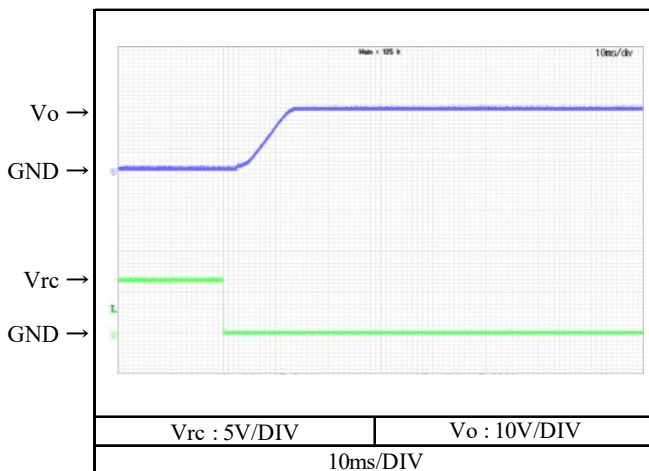
$I_o$  : 0 %

$T_a$  : 25 °C

$V_o=12V$



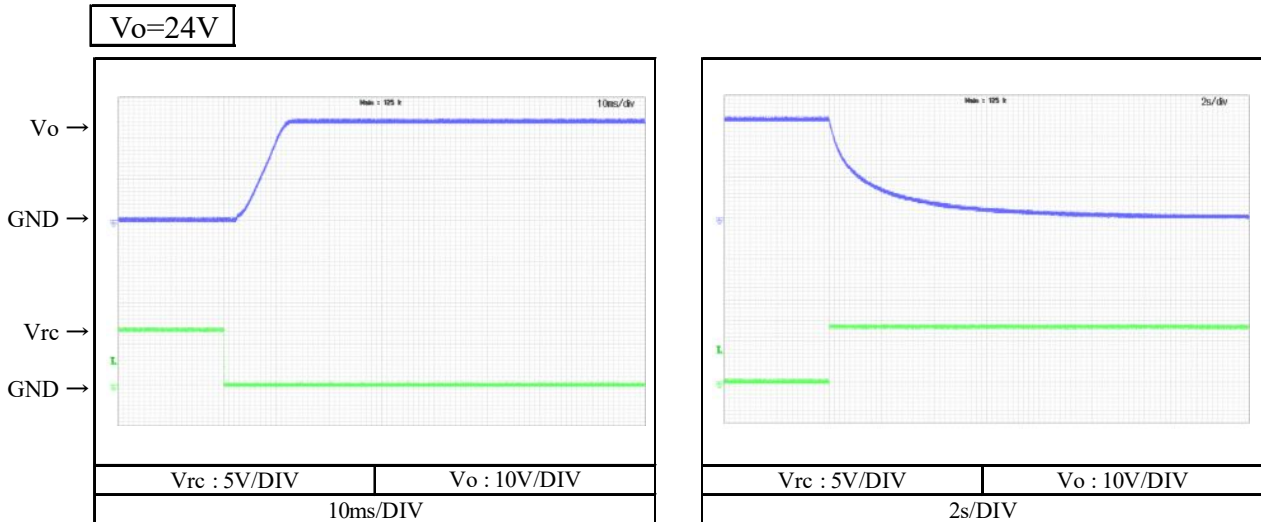
$V_o=15V$



2-4. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions  $V_{in}$  : 36 VDC  
 $I_o$  : 0 %  
 $T_a$  : 25 °C



2-4. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

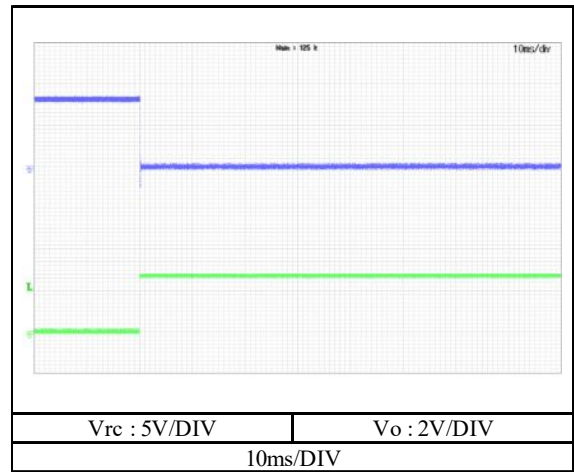
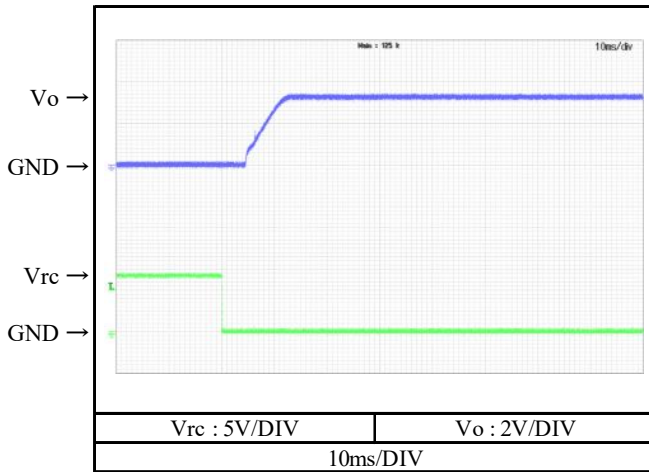
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions  $V_{in}$  : 24 VDC

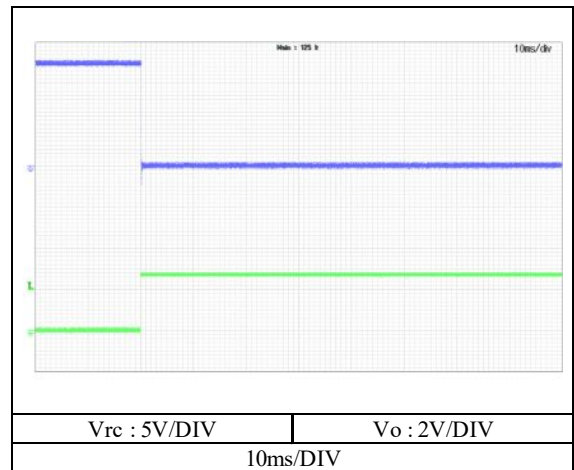
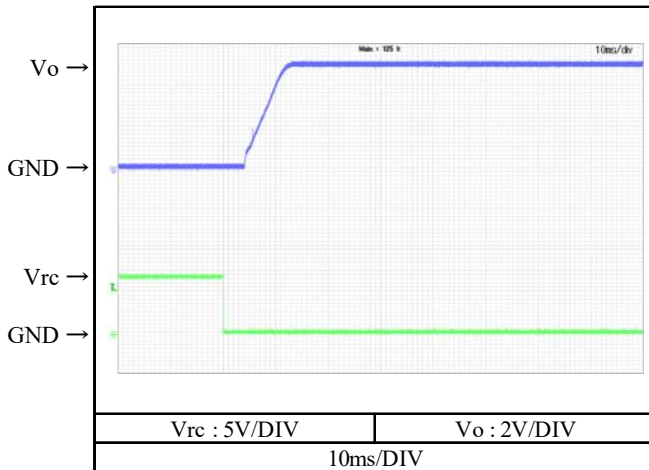
$I_o$  : 100 %

$T_a$  : 25 °C

$V_o=3.3V$



$V_o=5V$



2-4. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

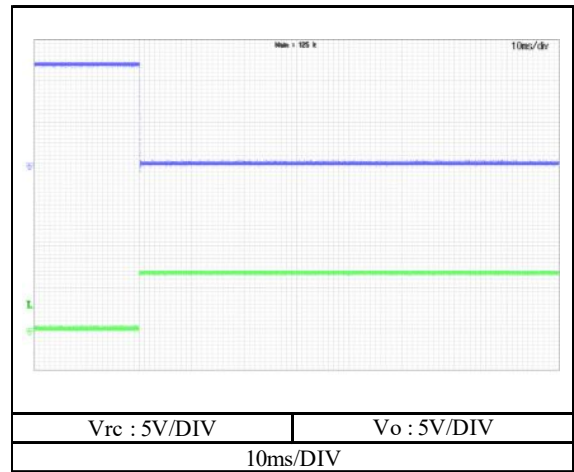
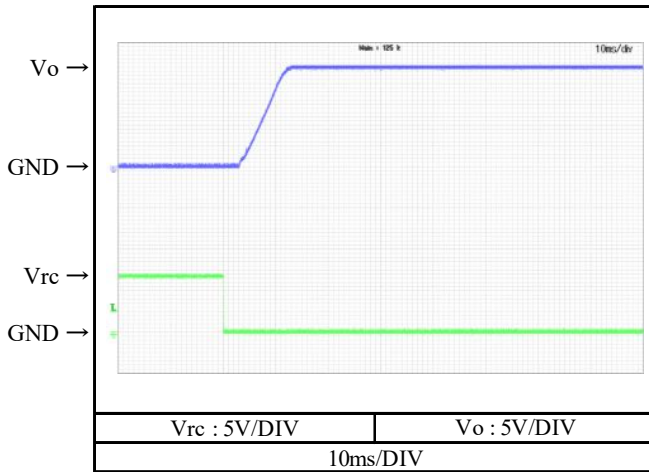
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions  $V_{in}$  : 24 VDC

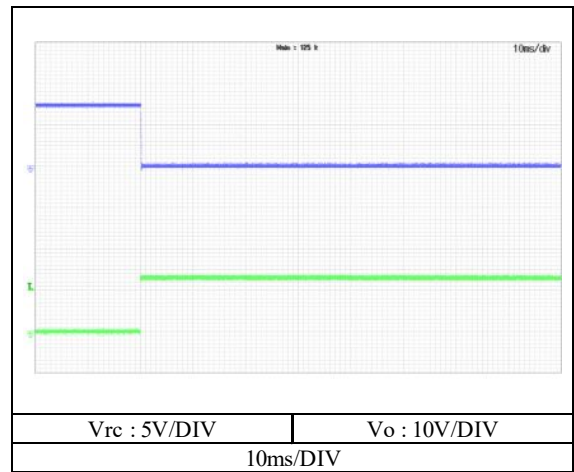
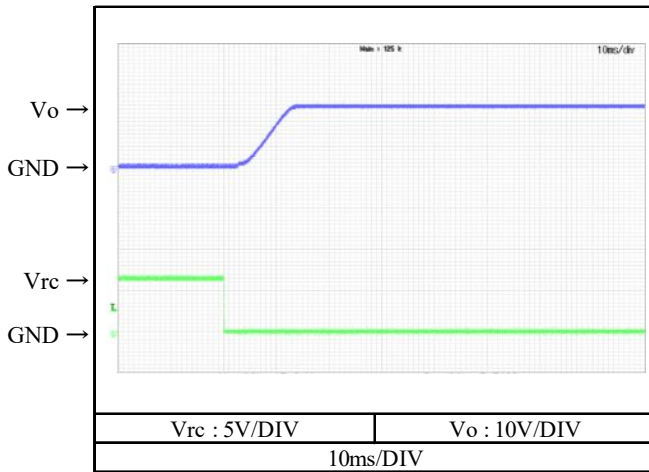
$I_o$  : 100 %

$T_a$  : 25 °C

$V_o=12V$



$V_o=15V$



2-4. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

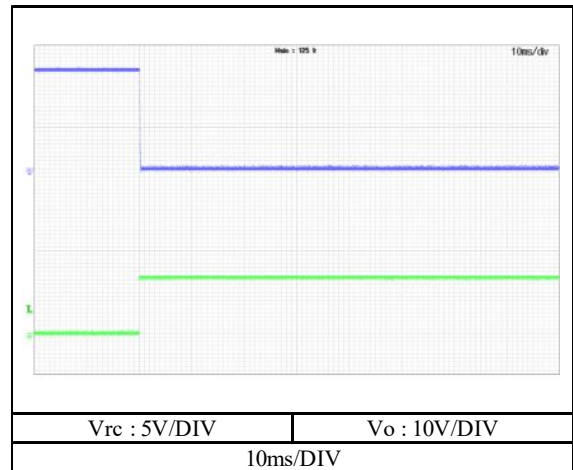
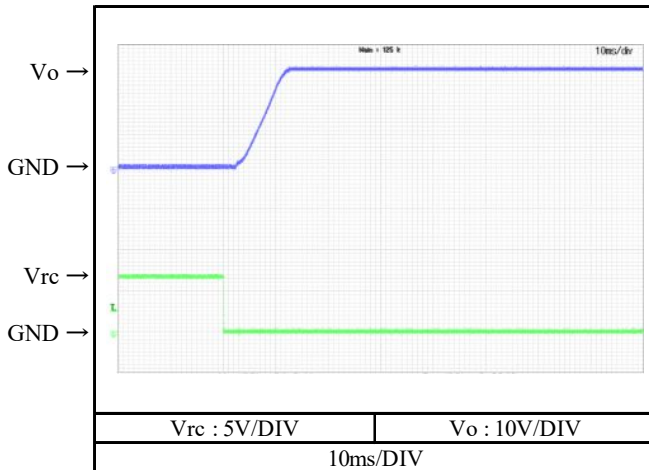
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 36 VDC

Io : 100 %

Ta : 25 °C

Vo=24V

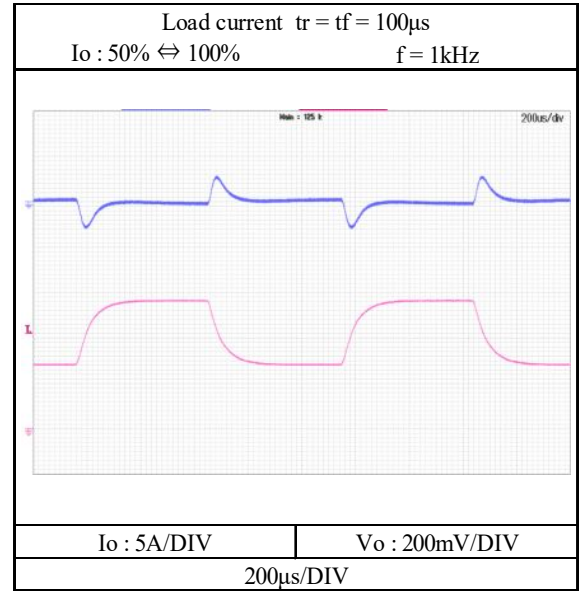
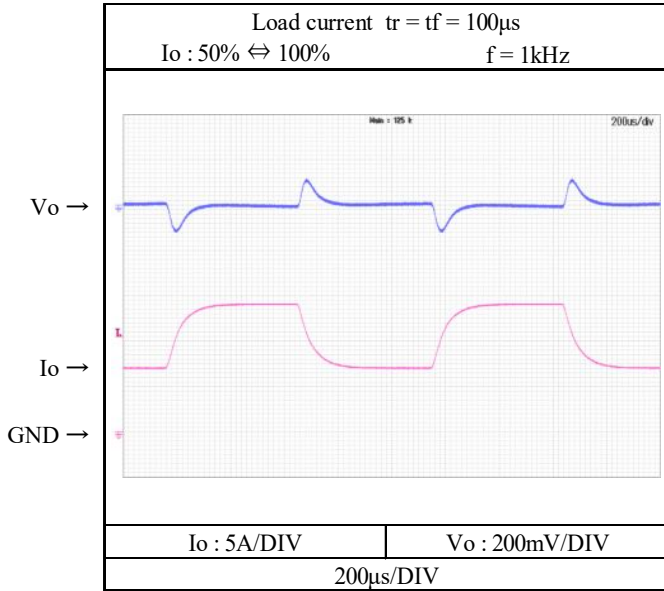


2-5. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions  $V_{in}$  : 24 VDC  
 $T_a$  : 25 °C

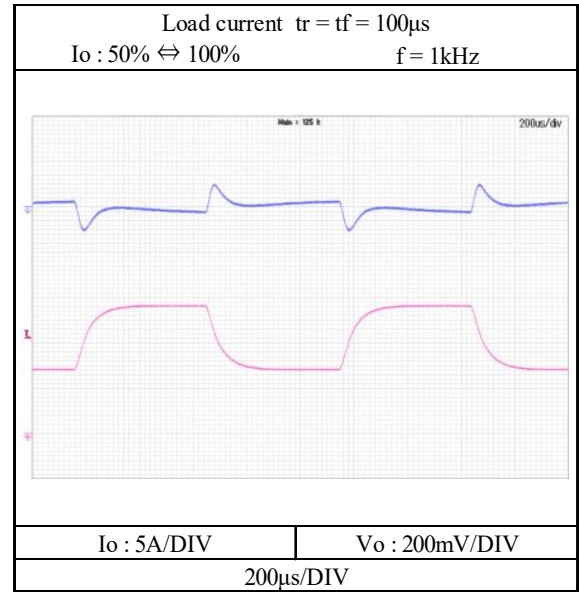
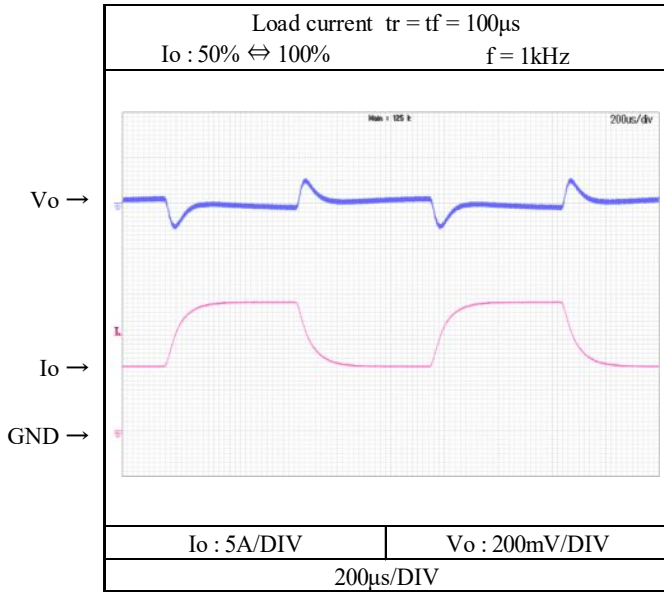
$V_o=3.3V$

$V_o=5V$



$V_o=12V$

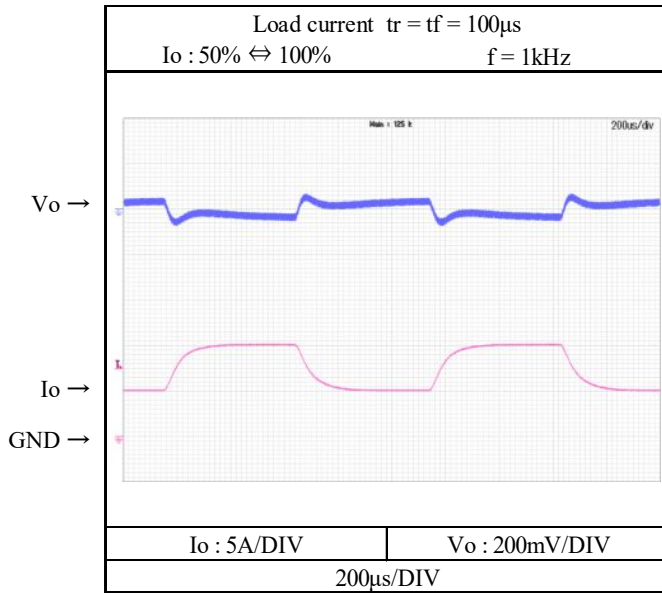
$V_o=15V$



2-5. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions  $V_{in}$  : 36 VDC  
 $T_a$  : 25 °C

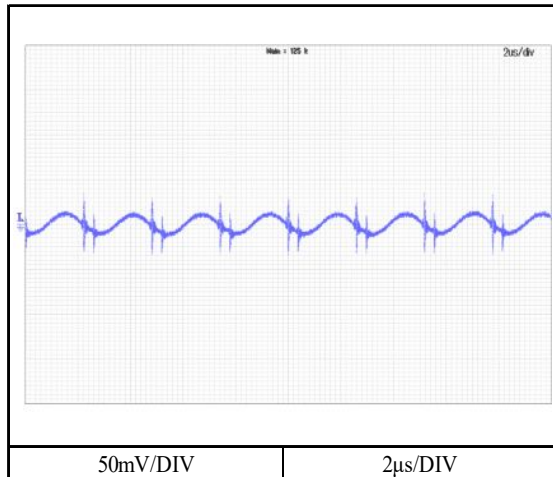
$V_o=24V$



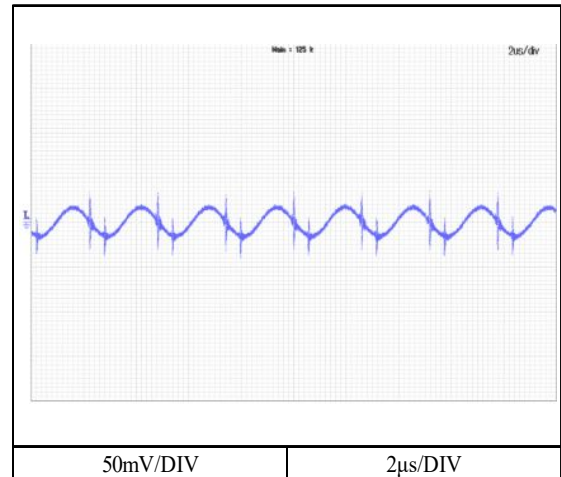
2-6. 出力リップル、ノイズ波形 Output ripple and noise waveform

Conditions  $V_{in}$  : 24 VDC  
 $I_o$  : 100 %  
 $T_a$  : 25 °C

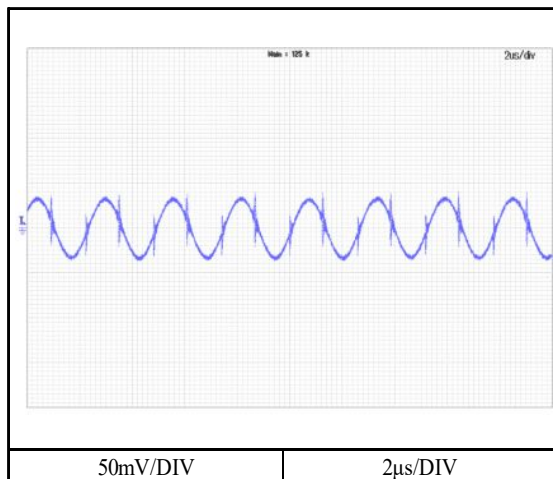
$V_o=3.3V$



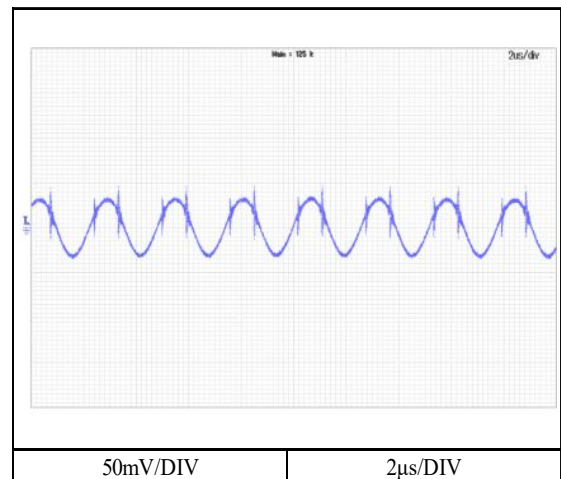
$V_o=5V$



$V_o=12V$



$V_o=15V$





2-6. 出力リップル、ノイズ波形 Output ripple and noise waveform

Conditions  $V_{in}$  : 36 VDC

$I_o$  : 100 %

$T_a$  : 25 °C

$V_o=24V$

