CCG10-24-xxS

EVALUATION DATA

型式データ

INDEX

使用記号 Terminology used

		定義 Definition	
Vin	·····	入力電圧	Input voltage
Vo	·····	出力電圧	Output voltage
V_{RC}	·····	RC電圧	RC voltage
Iin	·····	入力電流	Input current
Io	·····	出力電流	Output current
Ta	·····	周囲温度	Ambient temperature
f	·····	周波数	Frequency

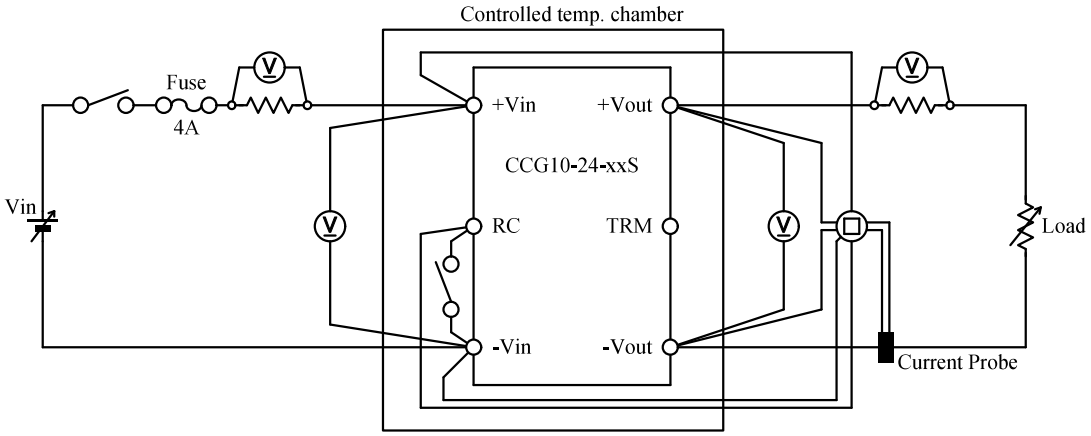
※ 当社測定条件における結果であり、参考値としてお考え願います。
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

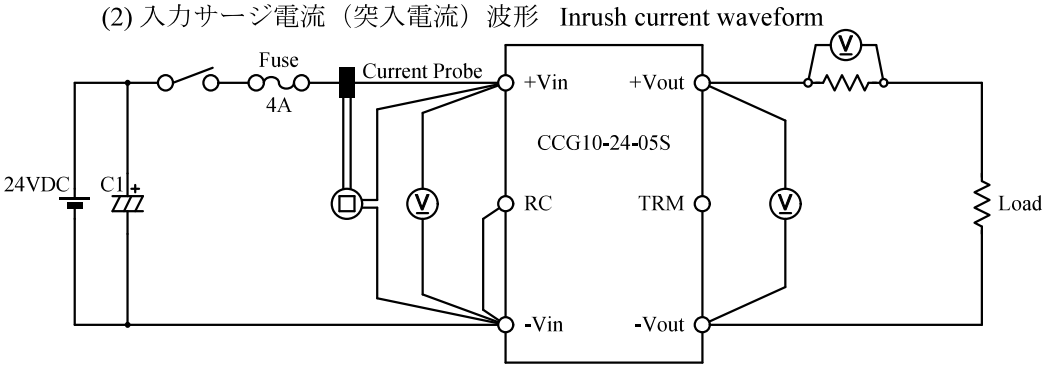
1-1. 測定回路 Measurement Circuits

(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



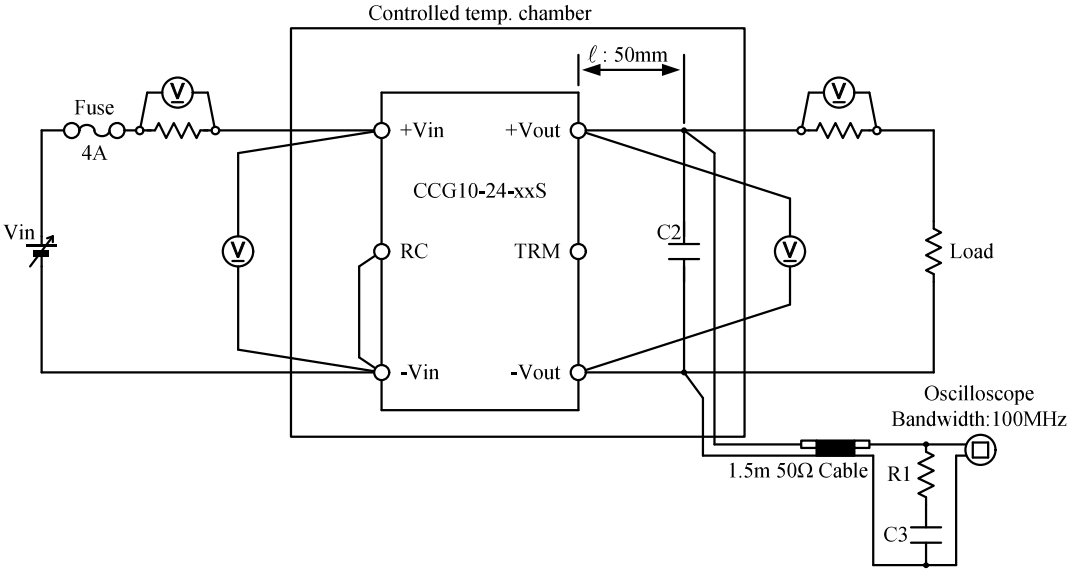
(2) 入力サージ電流（突入電流）波形 Inrush current waveform



CCG10-24-xxSの入力サージ電流特性はCCG10-24-05Sと同等です。

CCG10-24-xxS have the same Inrush current characteristics as CCG10-24-05S data.

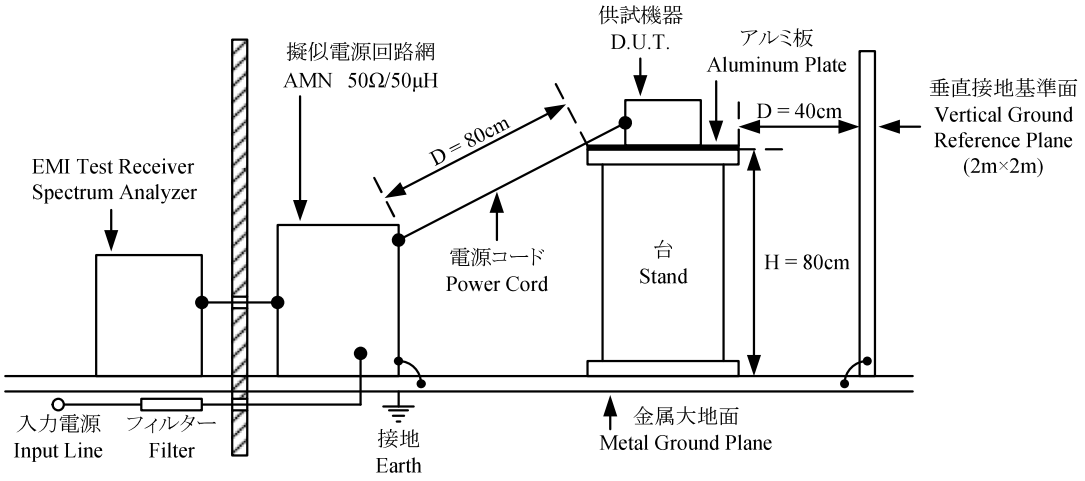
(3) 出力リップルノイズ電圧、波形 Output ripple and noise voltage and waveform



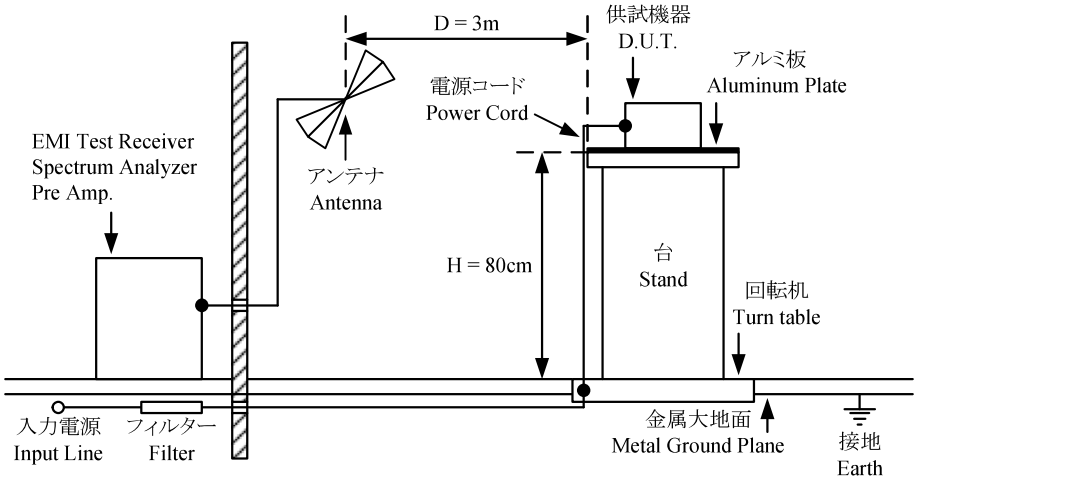
C1 : 4000uF Electrolytic Capacitor
C2 : 1uF Ceramic Capacitor
C3 : 4700pF Ceramic Capacitor
R1 : 50Ω

(4) EMI特性　Electro-Magnetic Interference characteristics

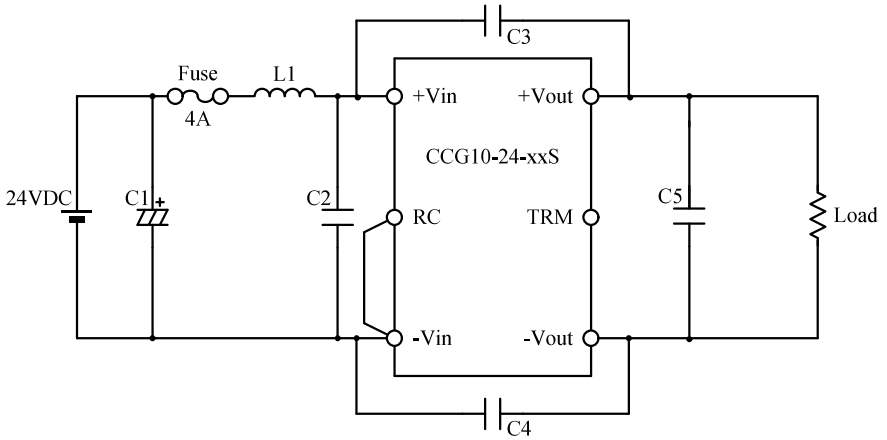
(a) 雑音端子電圧(帰還ノイズ) Conducted Emission Noise



(b) 雑音電界強度(輻射ノイズ) Radiated Emission Noise



VCCI class A 対応アプリケーション　VCCI class A application system



C1	:	50V	100uF	Electrolytic Capacitor	(ELXZ500ELL101MH12D,Nippon Chemi-con)
C2	:	50V	10uF	Ceramic Capacitor	(C3216X7R1H106KT,TDK)
C3	:	2kV	1000pF	Ceramic Capacitor	(C3225X7S3D102K200AA,TDK)
C4	:	2kV	1000pF	Ceramic Capacitor	(C3225X7S3D102K200AA,TDK)
C5	:	25V	10uF	Ceramic Capacitor	(C3216X7R1E106KT,TDK)
L1	:	2A	10uH	Normal Mode Choke Coil	(LQH5BPN100MT0L,MURATA)

1-2. 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DL1740E / DL1740EL
2	DIGITAL MULTIMETER	AGILENT	34970A
3	CURRENT PROBE	YOKOGAWA ELECT.	701932
4	CURRENT PROBE	AGILENT	N2774A
5	SHUNT RESISTER	YOKOGAWA ELECT.	2215
6	DYNAMIC DUMMY LOAD	KIKUSUI	PLZ-164WL
7	CVCF	NF	ES10000S
8	DC POWER SUPPLY	TDK-Lambda	GEN80-9.5 / GENH80-9.5
9	DC POWER SUPPLY	TAKASAGO	EX-750H2
10	CONTROLLED TEMP. CHAMBER	ESPEC	SU-261 / SU-262
11	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESR3
12	PRE AMP.	SONOMA	310N
13	AMN	KIKUSUI	KNW-242C
14	ANTENNA	SCHWARZBECK	BBA9106/VHA9103
15	ANTENNA	SCHWARZBECK	UHALP9107

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

3.3V

1. Regulation - line and load　　Condition　Ta :　25 ºC

Io \ Vin	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	3.2953V	3.2957V	3.2957V	3.2953V	0.4mV	0.012%
50% (1.3A)	3.2951V	3.2953V	3.2954V	3.2952V	0.3mV	0.009%
100% (2.6A)	3.2953V	3.2953V	3.2952V	3.2951V	0.2mV	0.006%
Load	0.2mV	0.4mV	0.5mV	0.2mV		
regulation	0.006%	0.012%	0.015%	0.006%		

2. Temperature drift　　Conditions　Vin :　24 VDC
Io :　100 %

Ta	-40°C	25°C	60°C	Temperature stability	
Vo	3.2903V	3.2952V	3.3000V	9.7mV	0.294%

5V

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

Io \ Vin	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	4.9901V	4.9906V	4.9907V	4.9907V	0.6mV	0.012%
50% (1A)	4.9900V	4.9902V	4.9903V	4.9904V	0.4mV	0.008%
100% (2A)	4.9904V	4.9904V	4.9903V	4.9904V	0.1mV	0.002%
Load	0.4mV	0.4mV	0.4mV	0.3mV		
regulation	0.008%	0.008%	0.008%	0.006%		

2. Temperature drift　　Conditions　Vin :　24 VDC
Io :　100 %

Ta	-40°C	25°C	65°C	Temperature stability	
Vo	4.9862V	4.9903V	4.9929V	6.7mV	0.134%

12V

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

Io \ Vin	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	11.9337V	11.9351V	11.9329V	11.9321V	3.0mV	0.025%
50% (0.45A)	11.9325V	11.9331V	11.9329V	11.9290V	4.1mV	0.034%
100% (0.9A)	11.9336V	11.9337V	11.9328V	11.9326V	1.1mV	0.009%
Load	1.2mV	2.0mV	0.1mV	3.6mV		
regulation	0.010%	0.017%	0.001%	0.030%		

2. Temperature drift　　Conditions　Vin :　24 VDC
Io :　100 %

Ta	-40°C	25°C	65°C	Temperature stability	
Vo	11.9440V	11.9328V	11.9268V	17.2mV	0.143%

15V

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

Io \ Vin	9VDC	12VDC	24VDC	36VDC	Line regulation	
0%	15.0643V	15.0664V	15.0642V	15.0597V	6.7mV	0.045%
50% (0.35A)	15.0643V	15.0653V	15.0651V	15.0616V	3.7mV	0.025%
100% (0.7A)	15.0675V	15.0677V	15.0665V	15.0626V	5.1mV	0.034%
Load	3.2mV	2.4mV	2.3mV	2.9mV		
regulation	0.021%	0.016%	0.015%	0.019%		

2. Temperature drift　　Conditions　Vin :　24 VDC
Io :　100 %

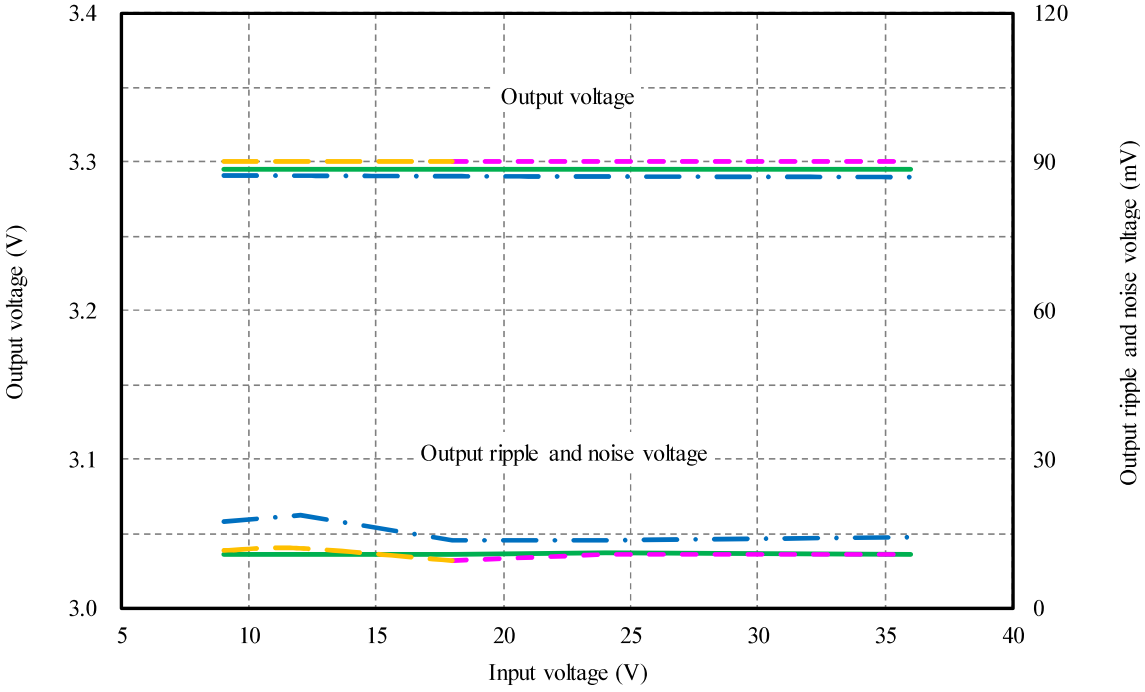
Ta	-40°C	25°C	70°C	Temperature stability	
Vo	15.0470V	15.0665V	15.0794V	32.4mV	0.216%

(2) 出力電圧・出力リップルノイズ電圧 対 入力電圧

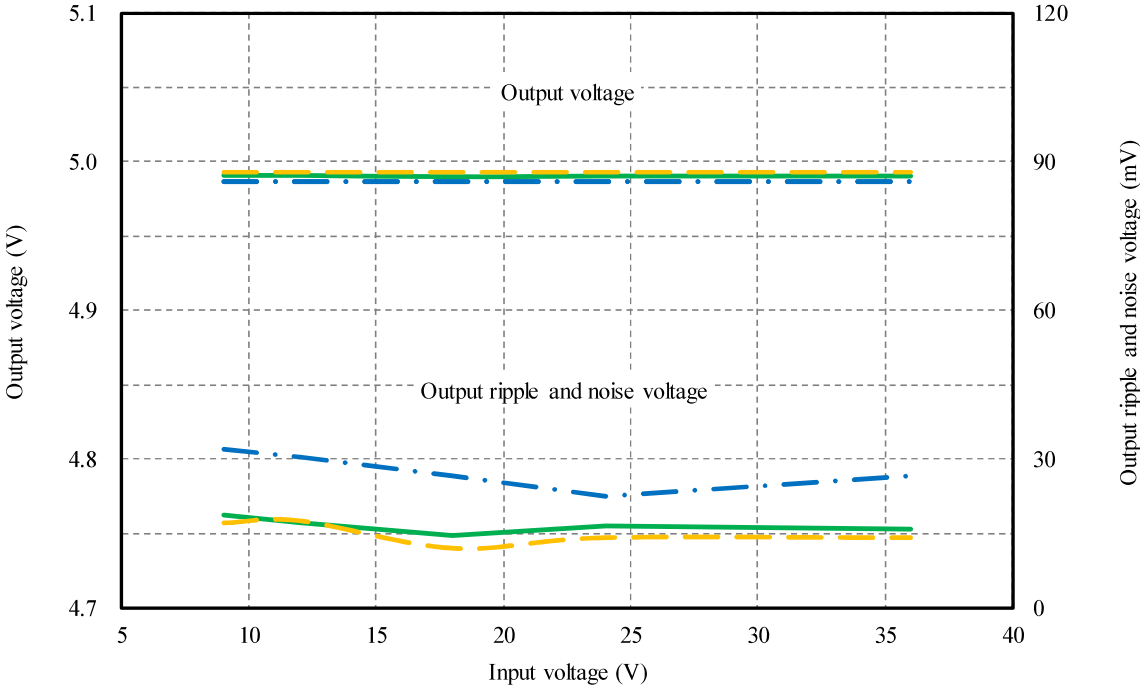
Output voltage and Output ripple and noise voltage vs. Input voltage

Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 60 °C
: 65 °C

3.3V



5V

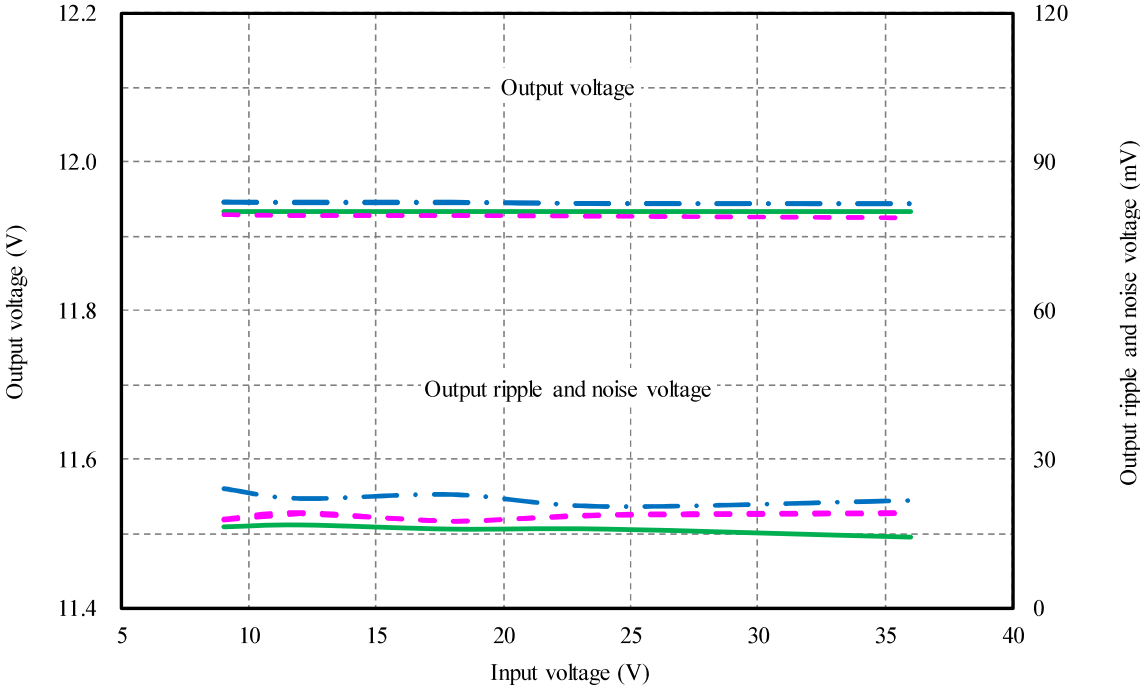


(2) 出力電圧・出力リップルノイズ電圧 対 入力電圧

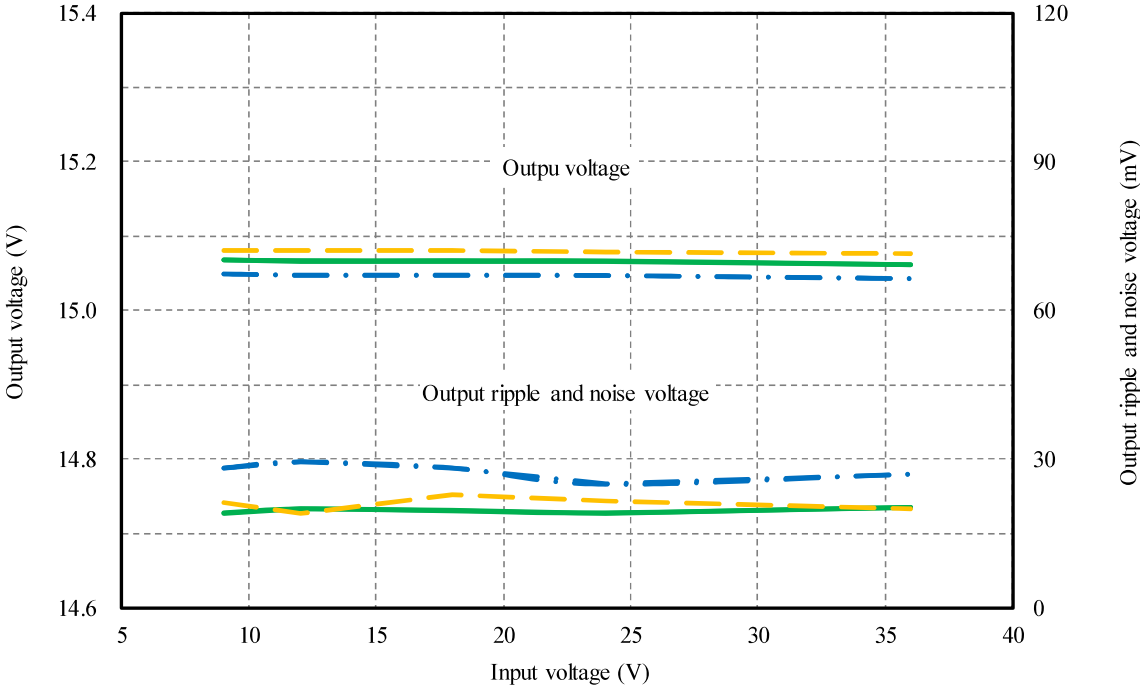
Output voltage and Output ripple and noise voltage vs. Input voltage

Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 65 °C
: 70 °C

12V



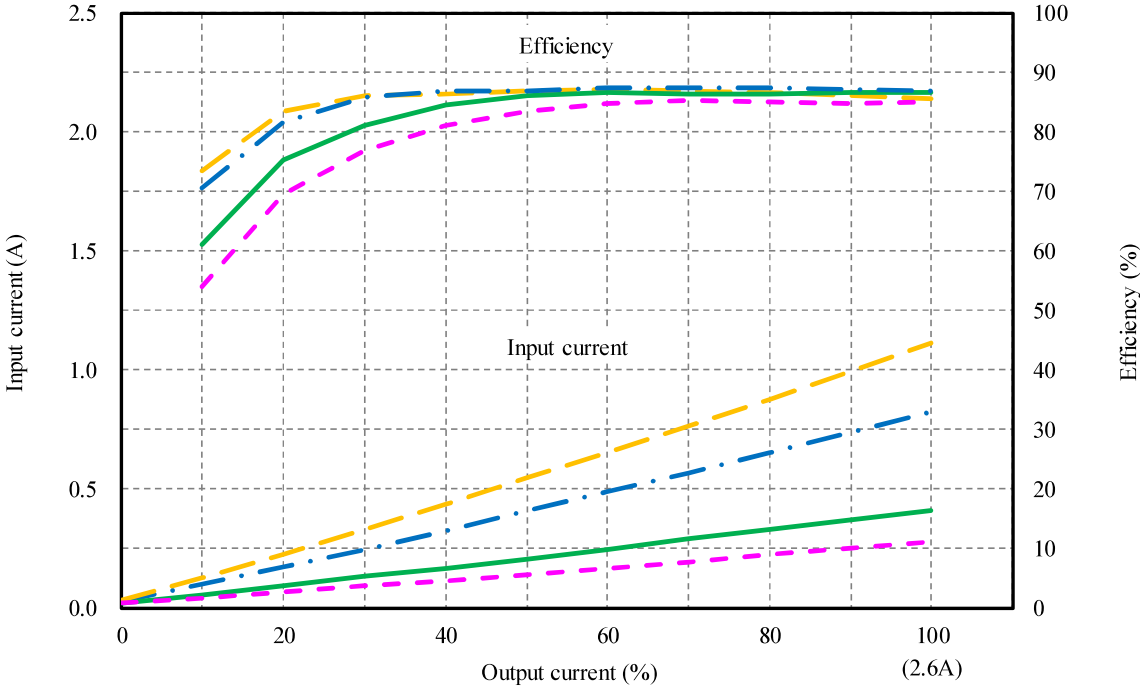
15V



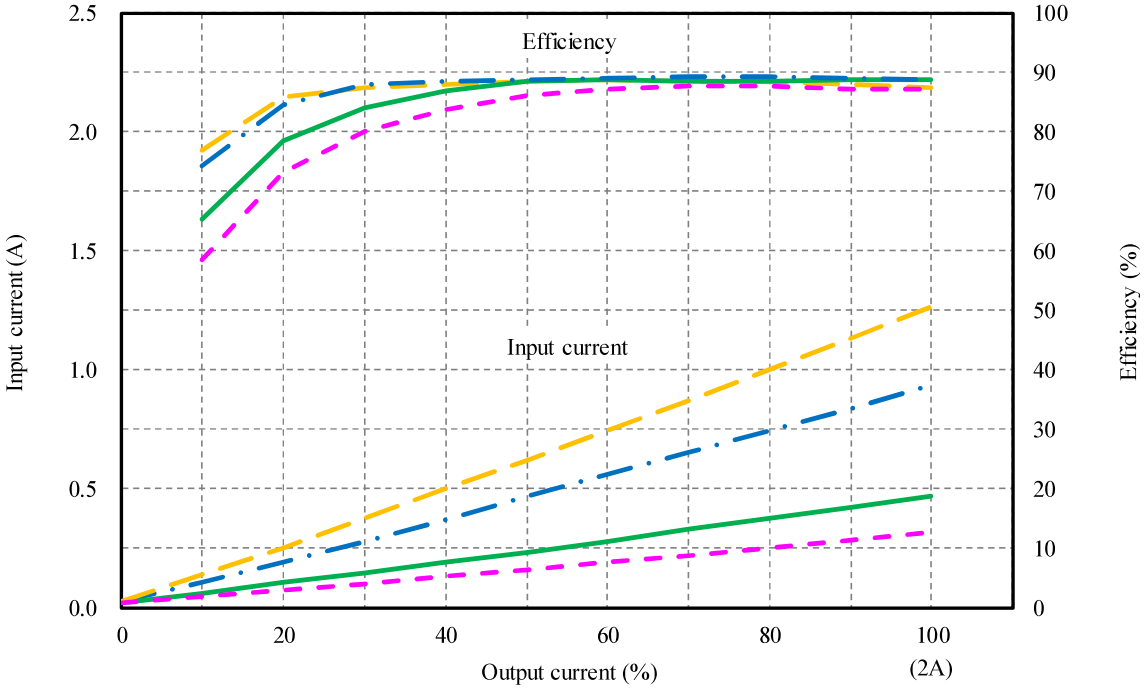
(3) 入力電流・効率 対 出力電流 Input current and Efficiency vs. Output current

Conditions Vin : 9 VDC
: 12 VDC
: 24 VDC
: 36 VDC
Ta : 25 °C

3.3V



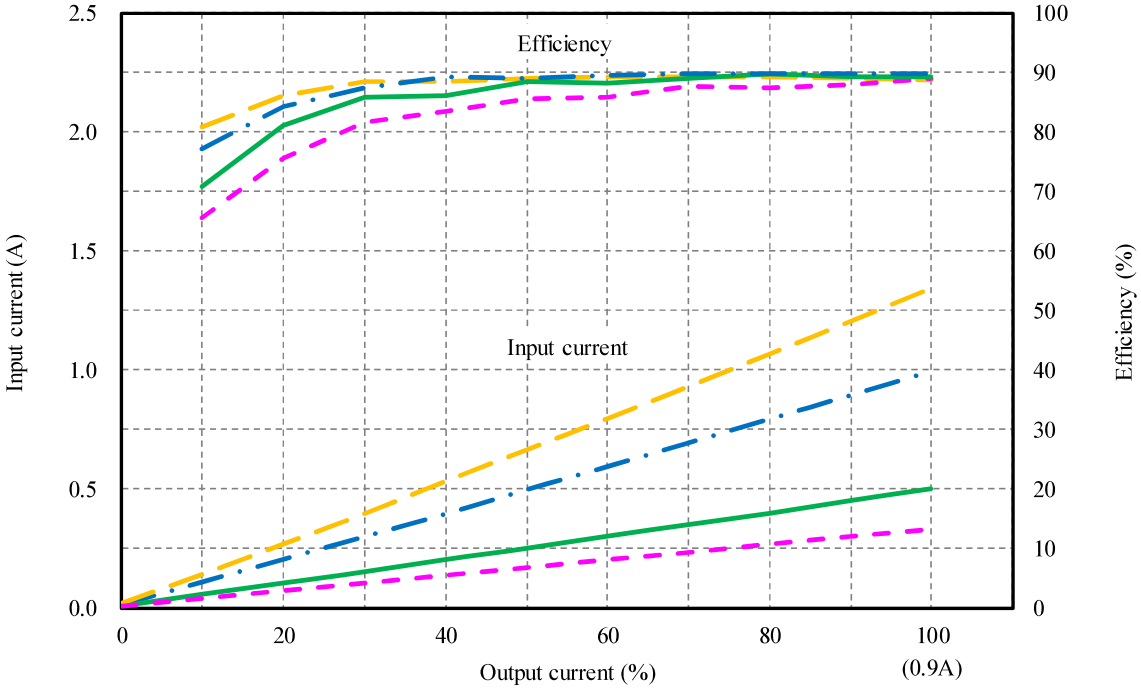
5V



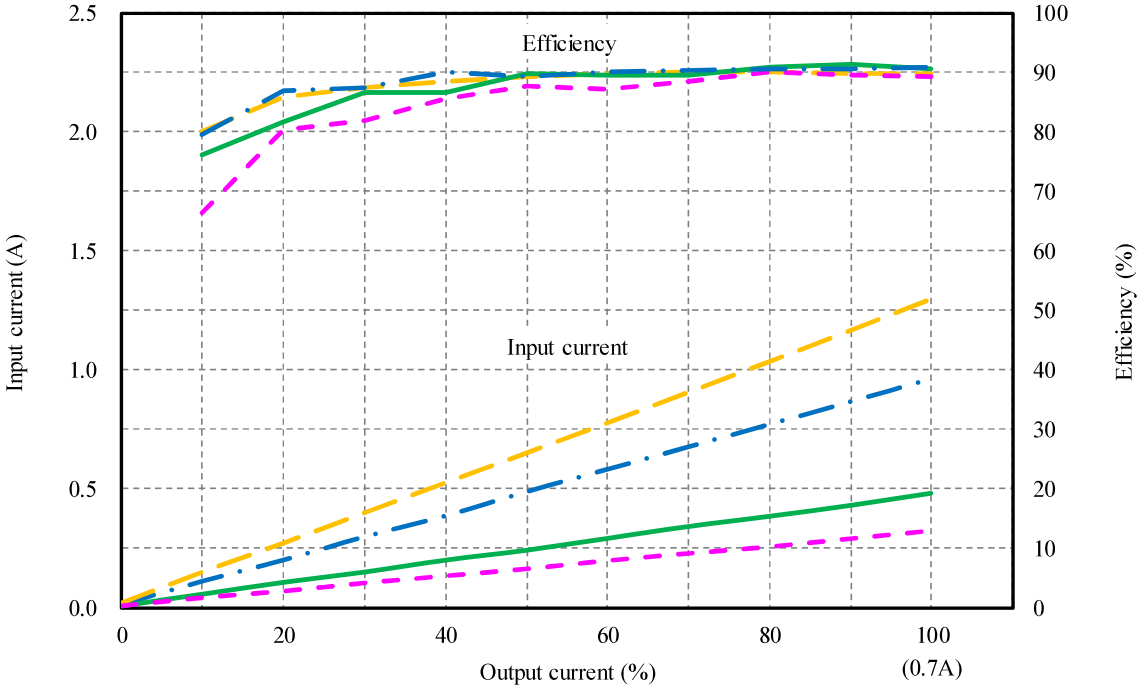
(3) 入力電流・効率 対 出力電流　Input current and Efficiency vs. Output current

Conditions　Vin　:　9 VDC
:　12 VDC
:　24 VDC
:　36 VDC
Ta　:　25 °C

12V



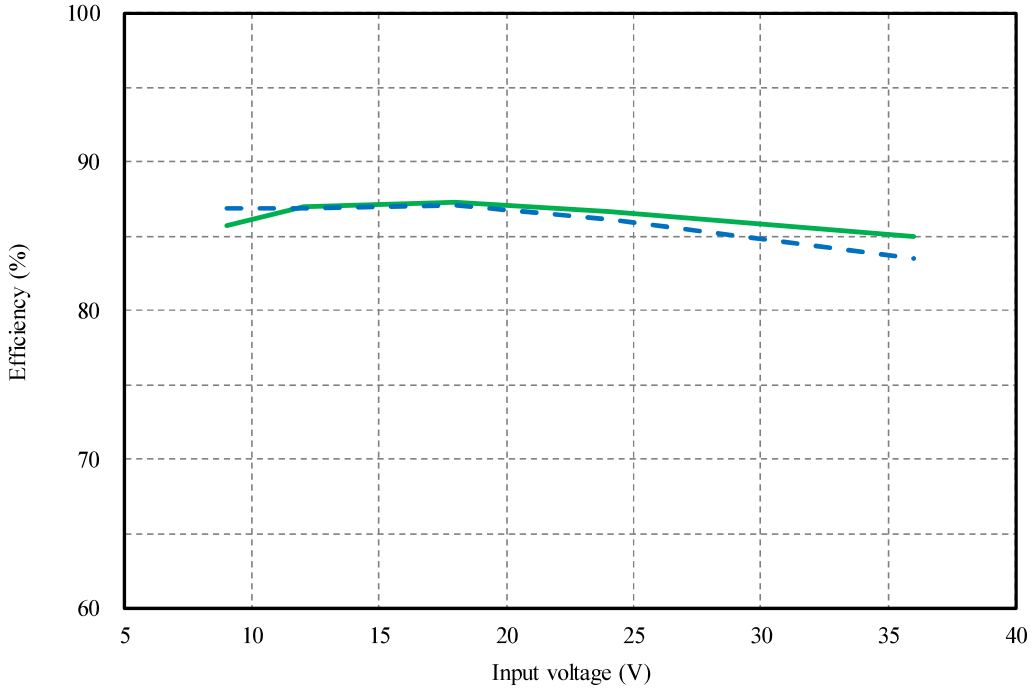
15V



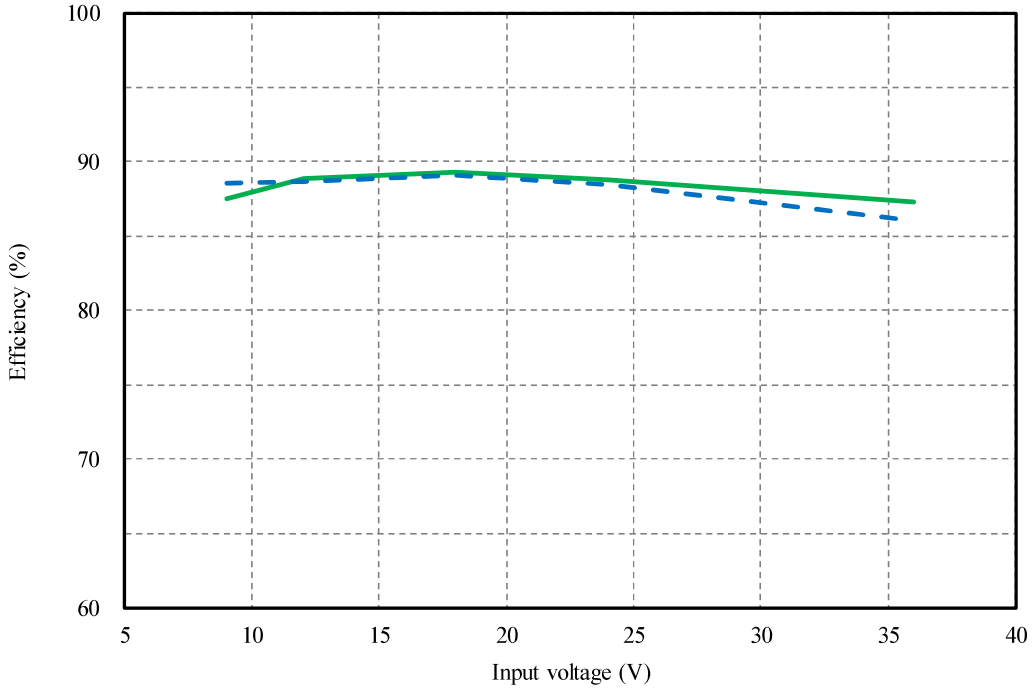
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

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

3.3V



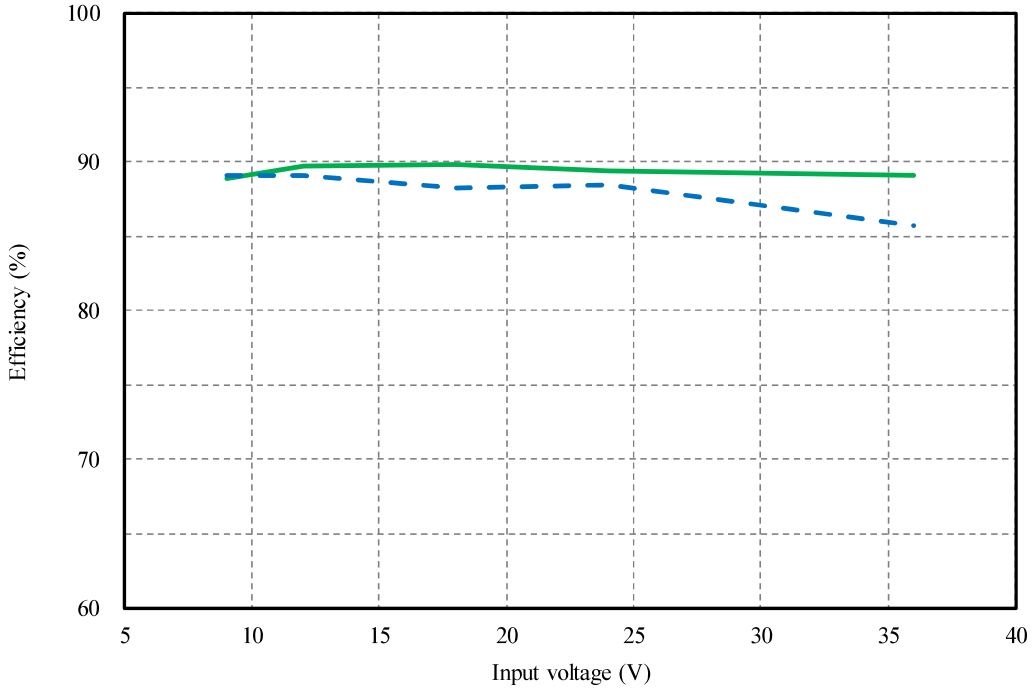
5V



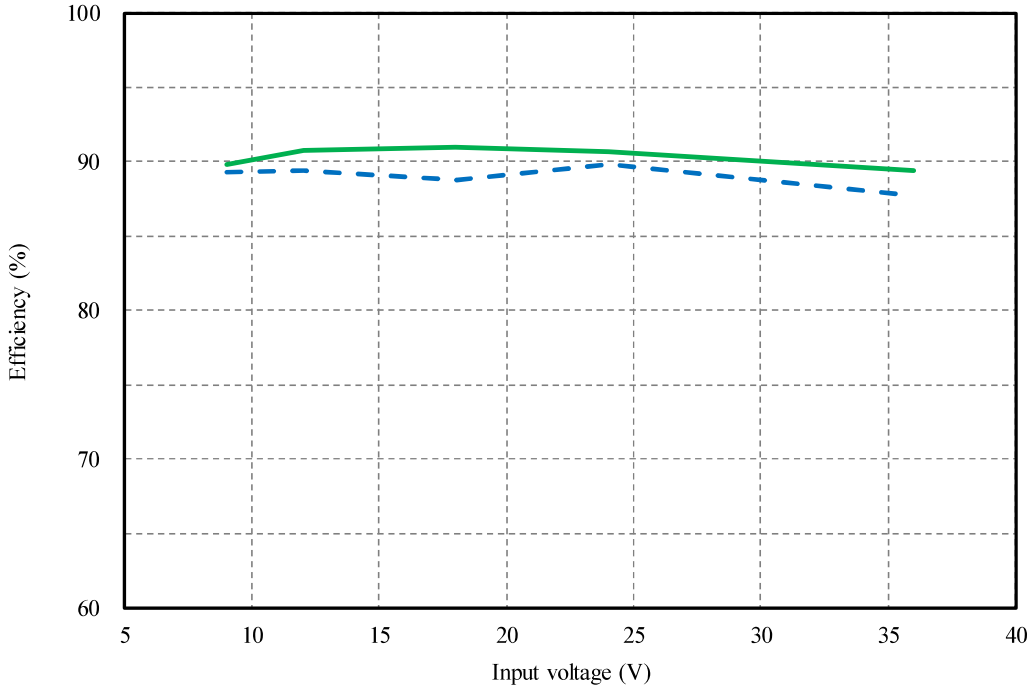
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

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

12V



15V



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

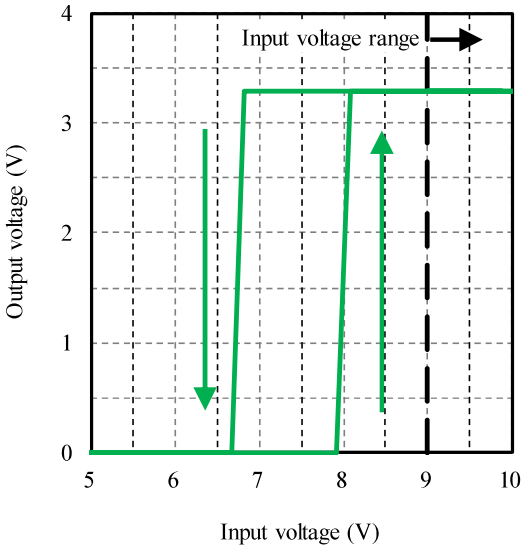
出力電圧 対 入力電圧
Output voltage vs. Input voltage

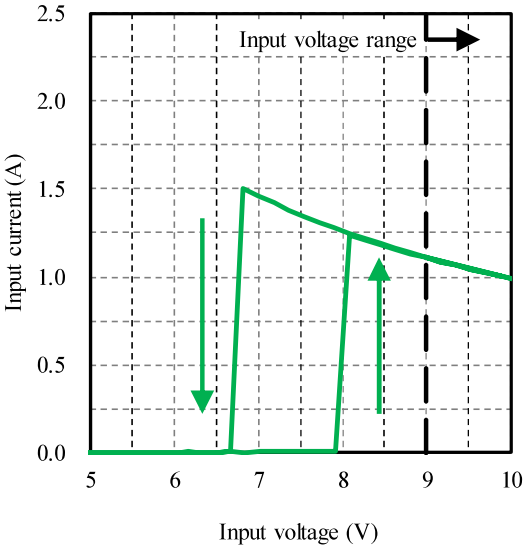
Conditions Io : 100 %
Ta : 25 °C

入力電流 対 入力電圧
Input current vs. Input voltage

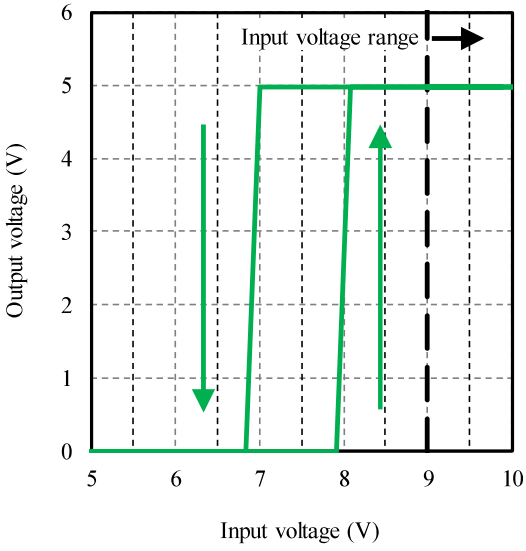
Conditions Io : 100 %
Ta : 25 °C

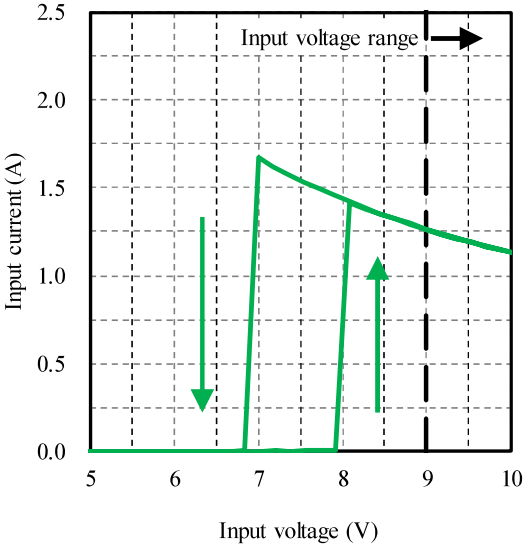
3.3V





5V



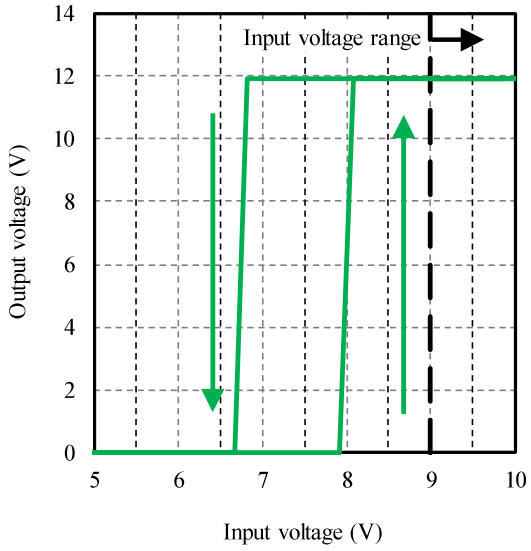


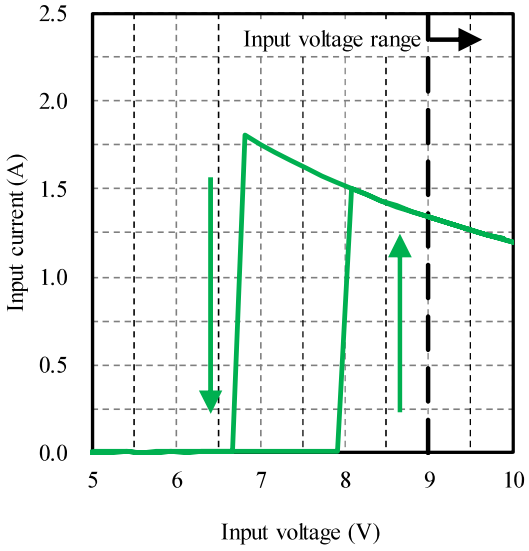
(5) 起動･遮断電圧特性 Start up and Drop out voltage characteristics

出力電圧 対 入力電圧
Output voltage vs. Input voltage
Conditions Io : 100 %
Ta : 25 °C

入力電流 対 入力電圧
Input current vs. Input voltage
Conditions Io : 100 %
Ta : 25 °C

12V





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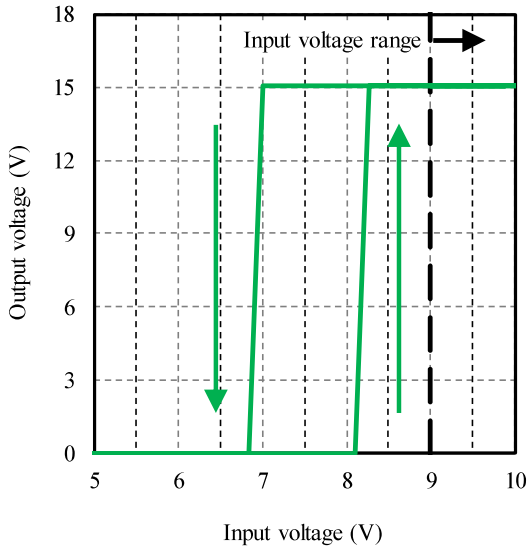
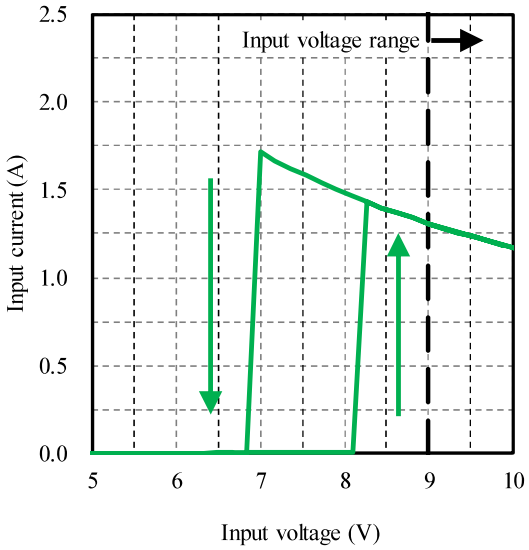
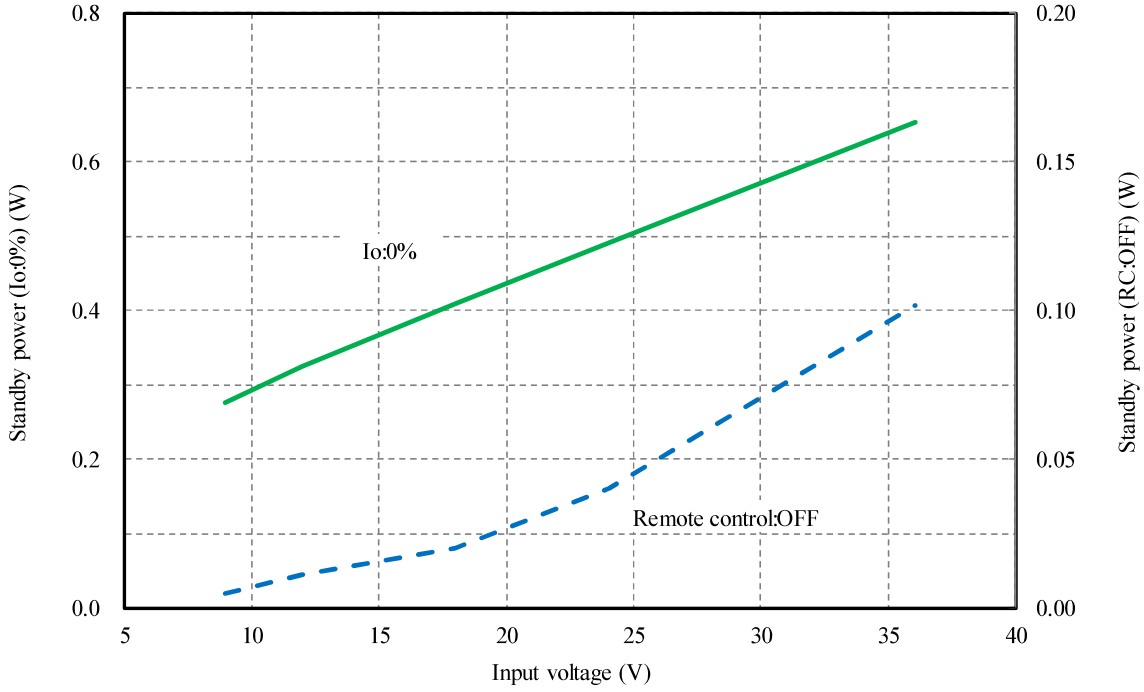




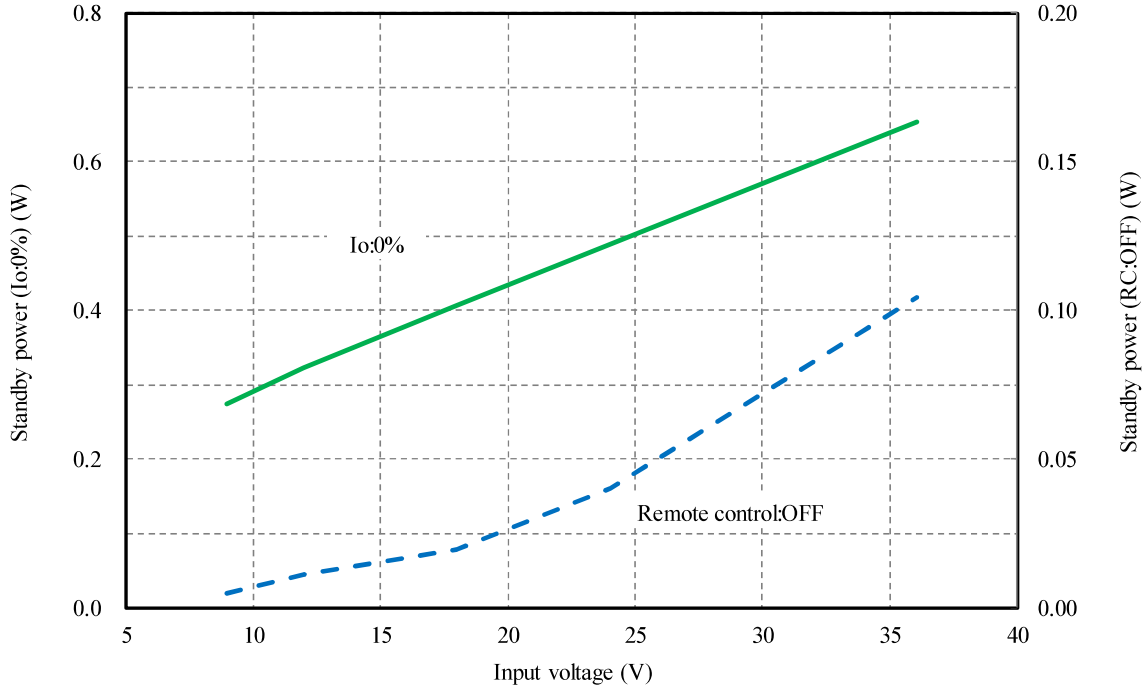
2-2. 待機電力特性 Standby power characteristics

Condition Ta : 25 °C

3.3V



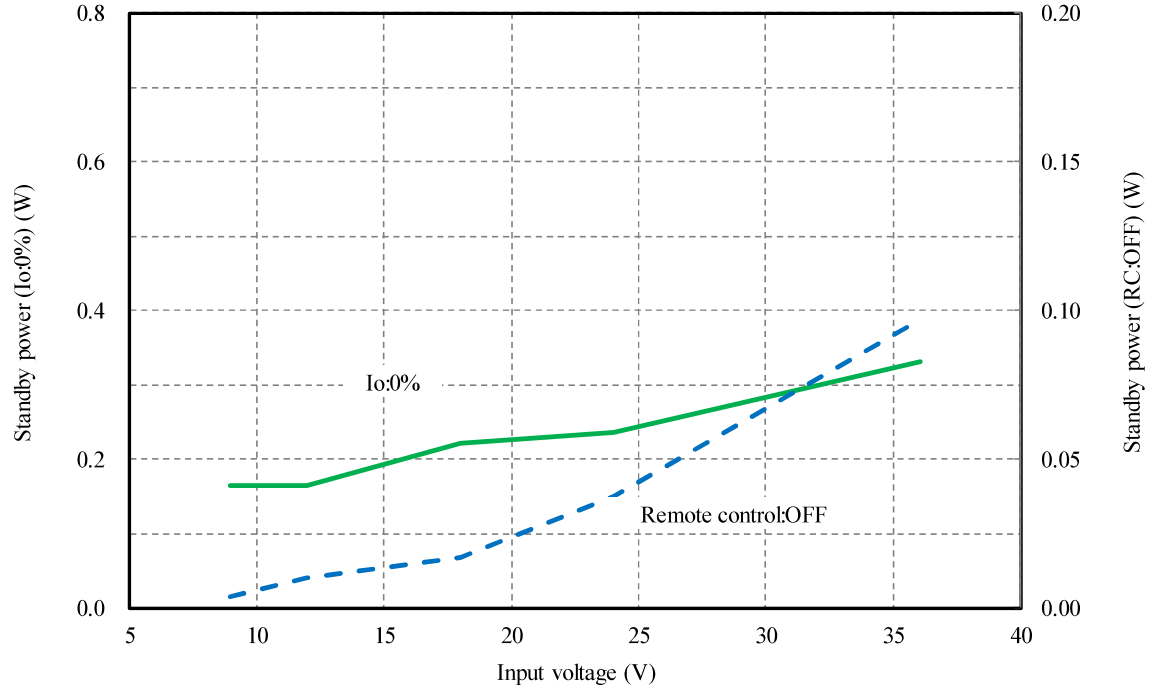
5V



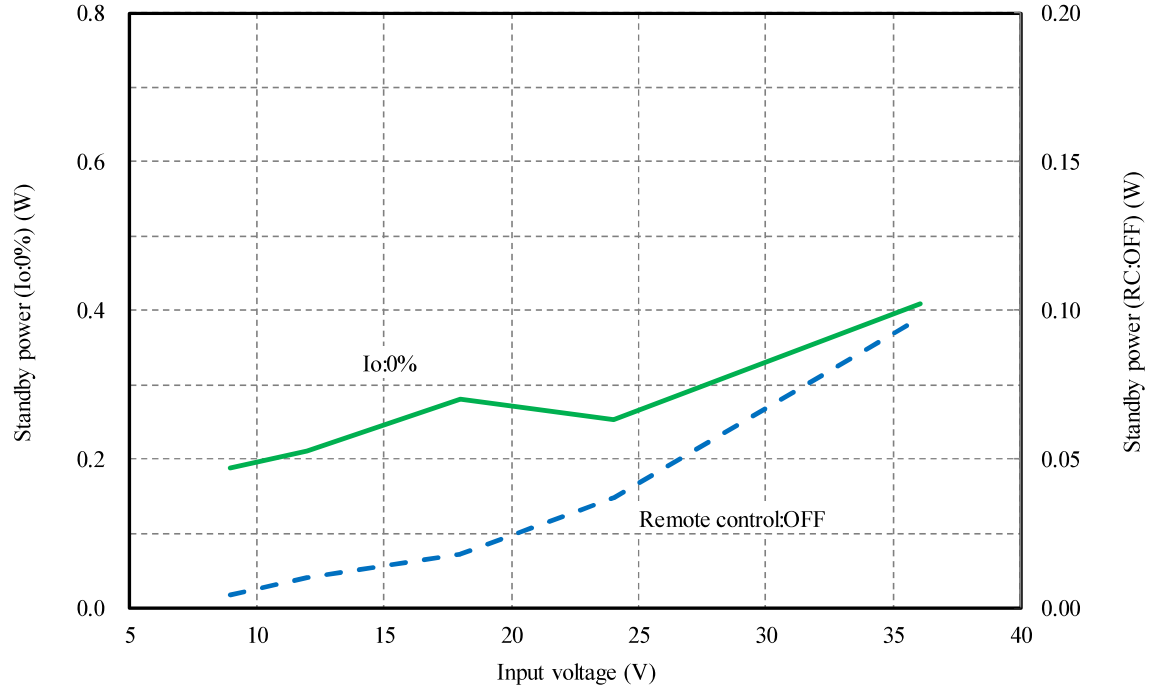
2-2. 待機電力特性 Standby power characteristics

Condition Ta : 25 °C

12V



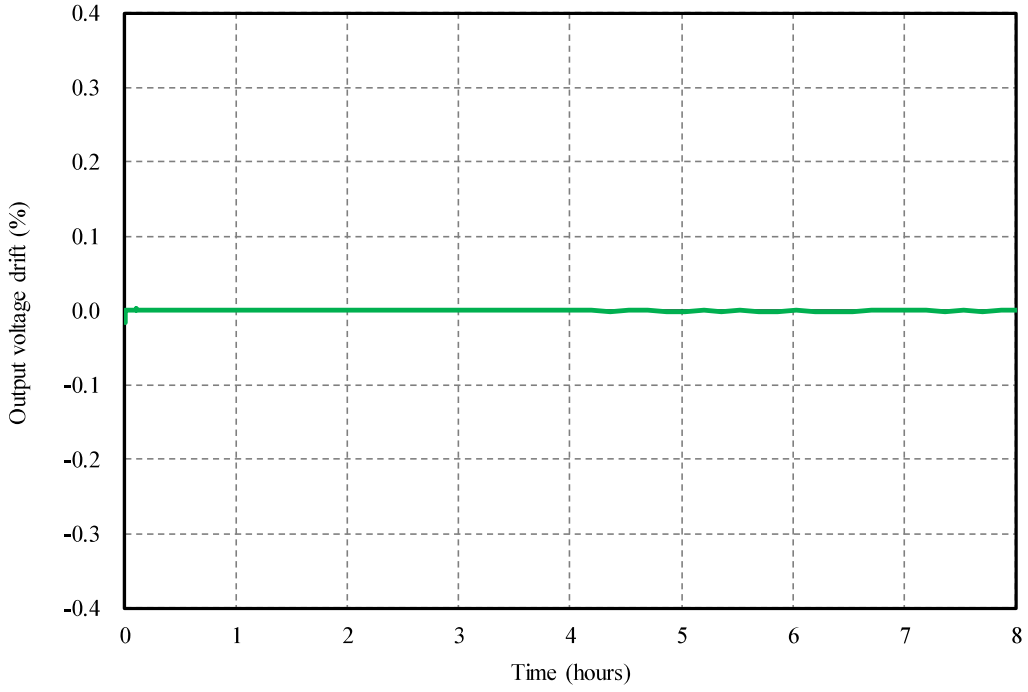
15V



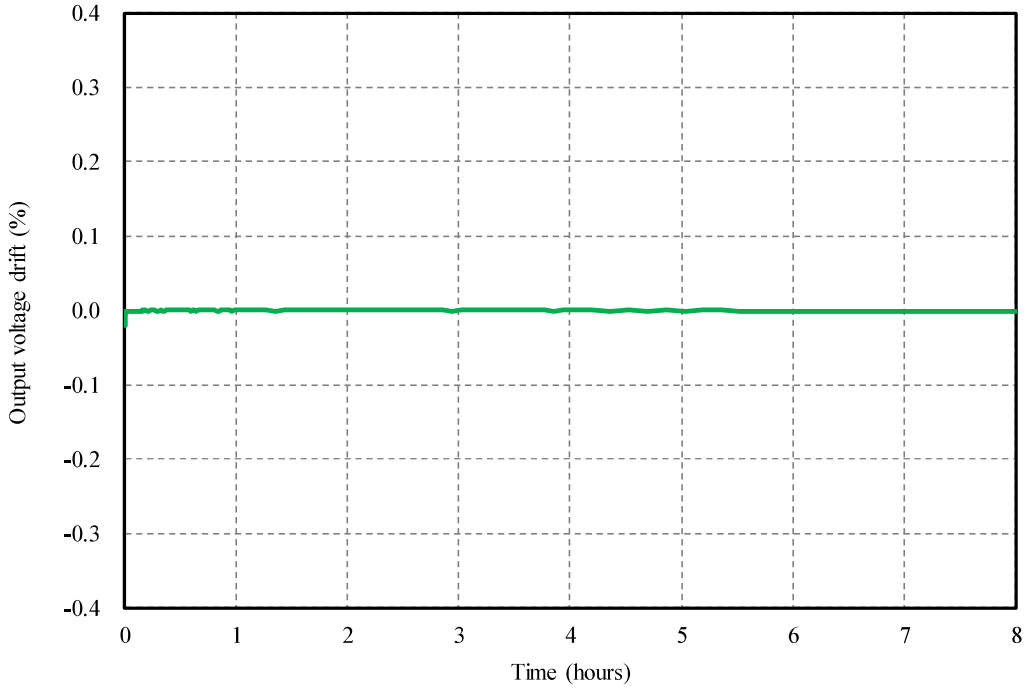
2-3. 通電ドリフト特性 Warm up voltage drift characteristics

Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

3.3V



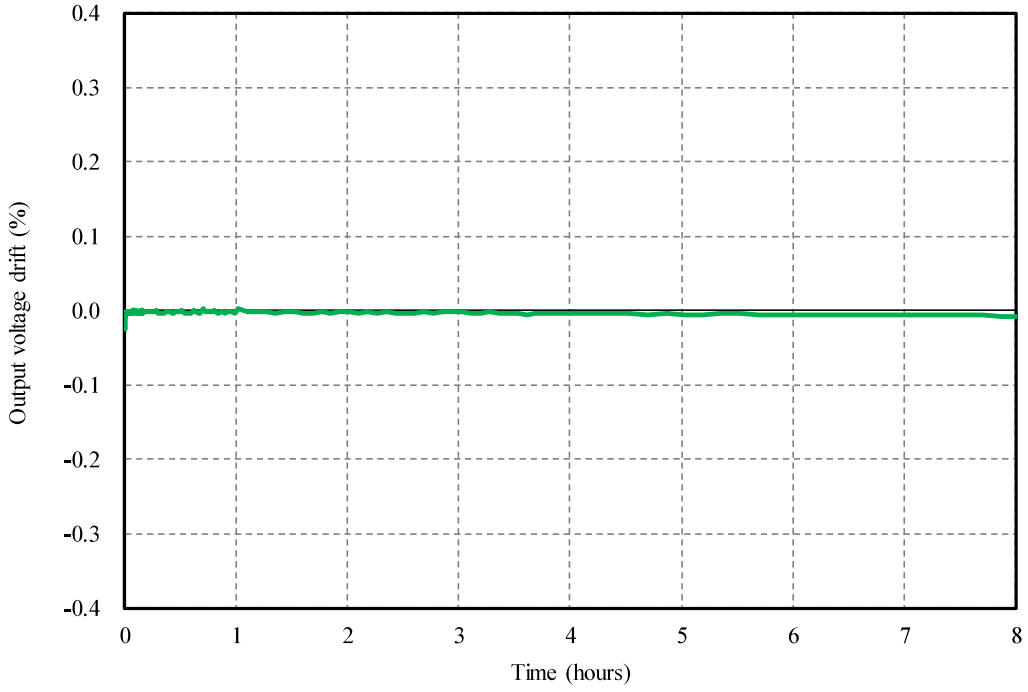
5V



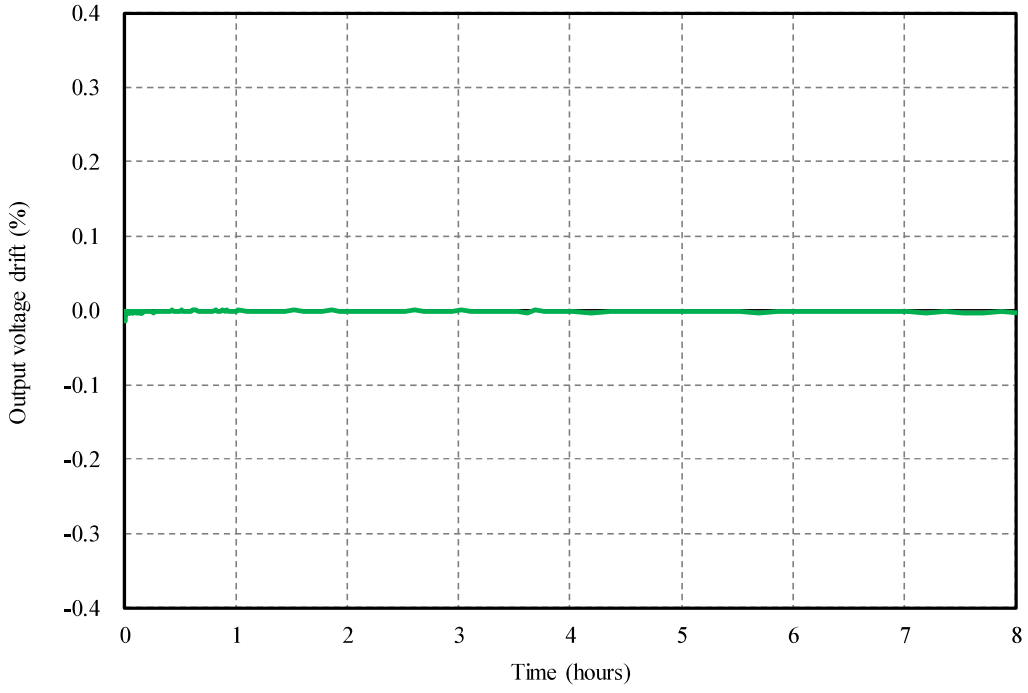
2-3. 通電ドリフト特性 Warm up voltage drift characteristics

Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

12V



15V



2-4. 過電流保護特性 Over current protection (OCP) characteristics

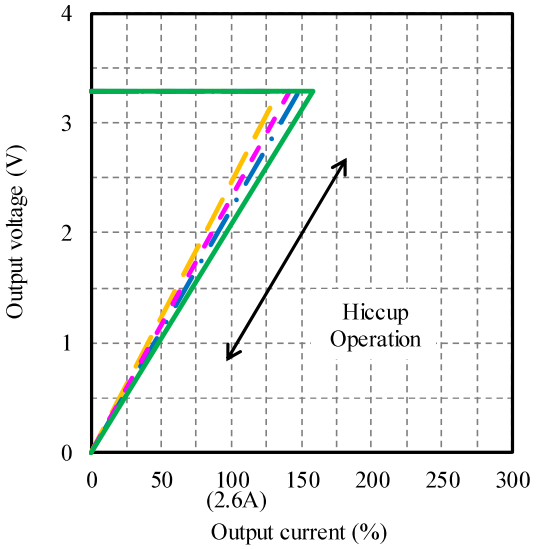
入力電圧依存性
Input voltage dependence

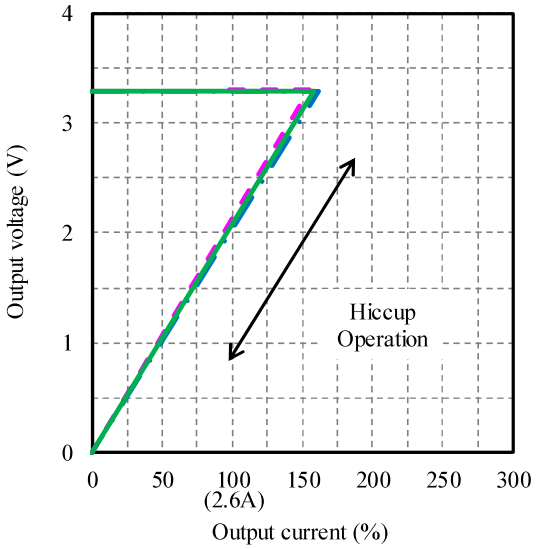
Conditions Vin : 9 VDC
: 12 VDC
: 24 VDC
: 36 VDC
Ta : 25 °C

周囲温度依存性
Ambient temperature dependence

Conditions Vin : 24 VDC
Ta : -40 °C
: 25 °C
: 60 °C

3.3V

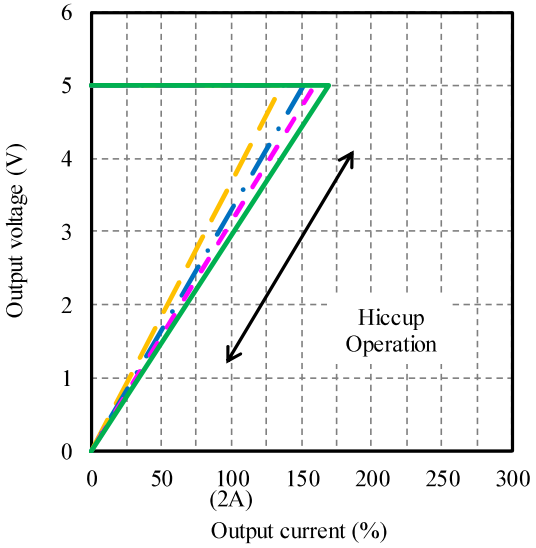


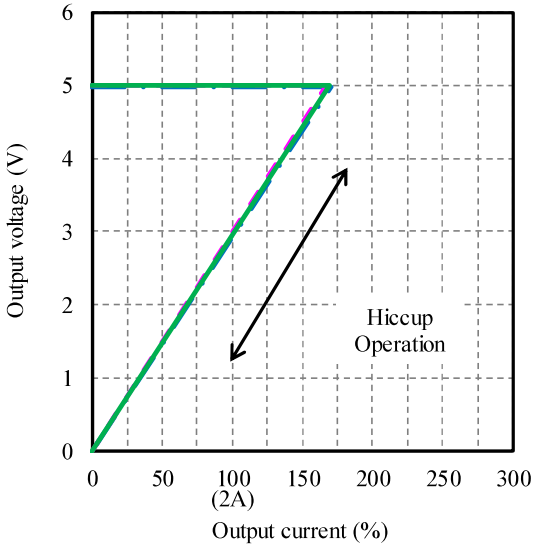


Conditions Vin : 9 VDC
: 12 VDC
: 24 VDC
: 36 VDC
Ta : 25 °C

Conditions Vin : 24 VDC
Ta : -40 °C
: 25 °C
: 65 °C

5V





2-4. 過電流保護特性 Over current protection (OCP) characteristics

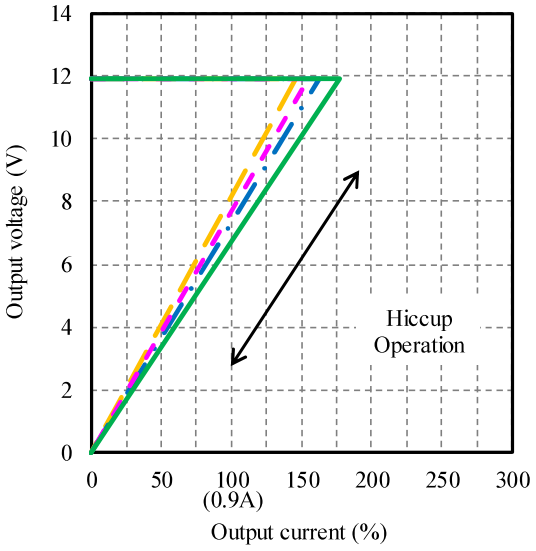
入力電圧依存性
Input voltage dependence

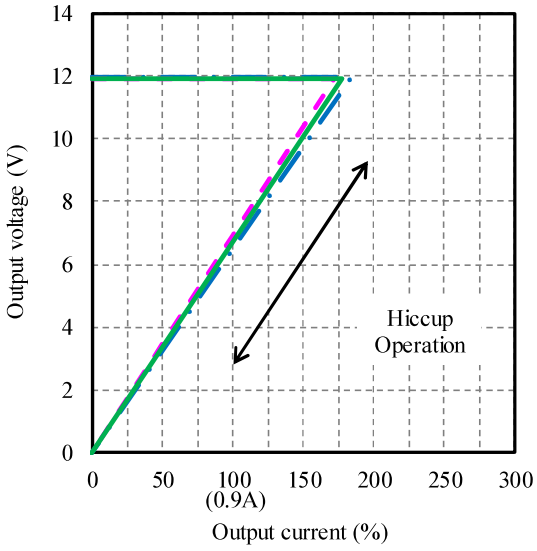
Conditions Vin : 9 VDC
: 12 VDC
: 24 VDC
: 36 VDC
Ta : 25 °C

周囲温度依存性
Ambient temperature dependence

Conditions Vin : 24 VDC
Ta : -40 °C
: 25 °C
: 65 °C

12V

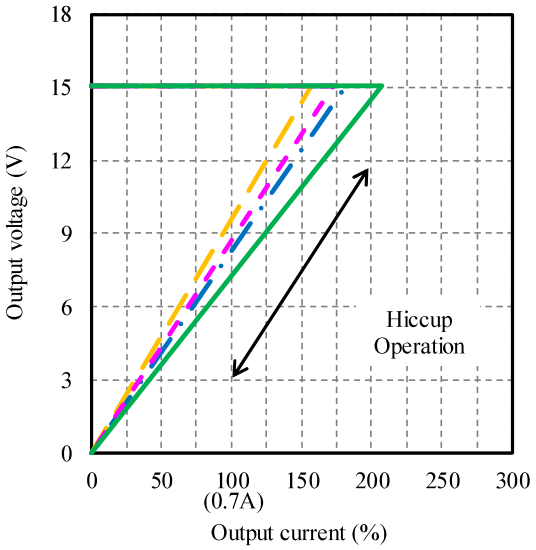


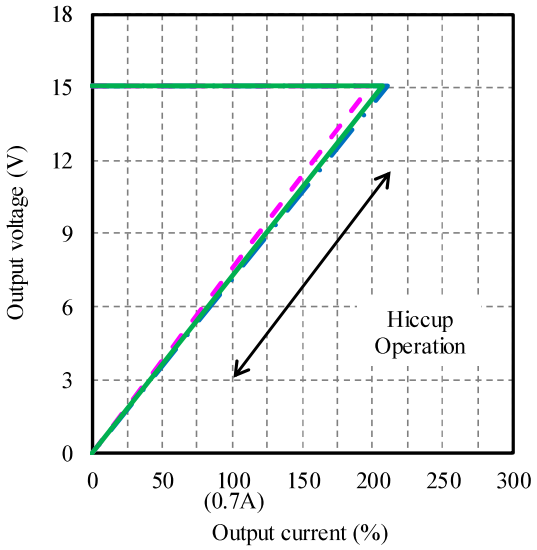


Conditions Vin : 9 VDC
: 12 VDC
: 24 VDC
: 36 VDC
Ta : 25 °C

Conditions Vin : 24 VDC
Ta : -40 °C
: 25 °C
: 70 °C

15V

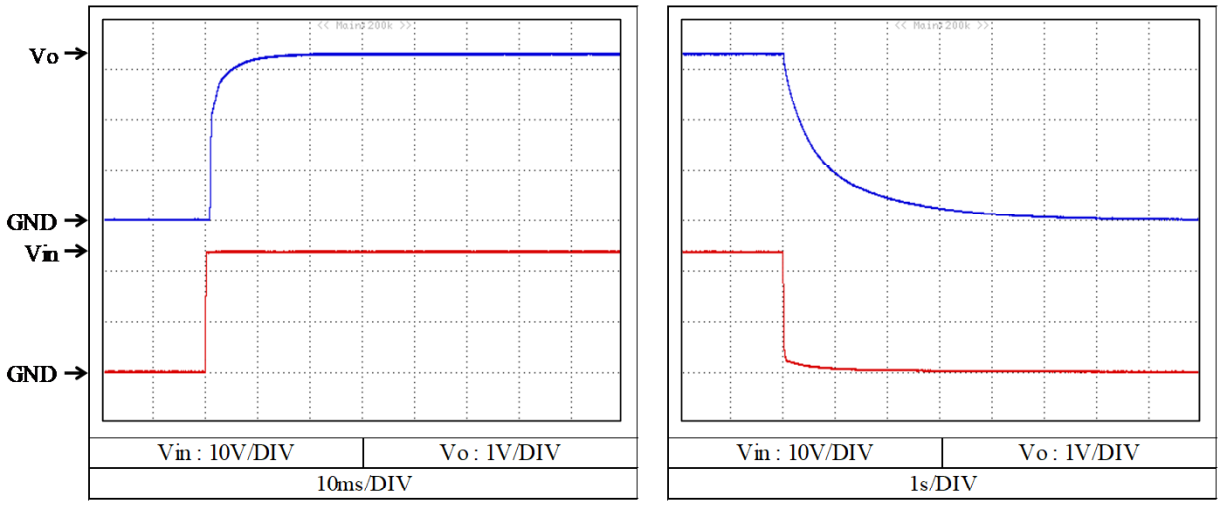




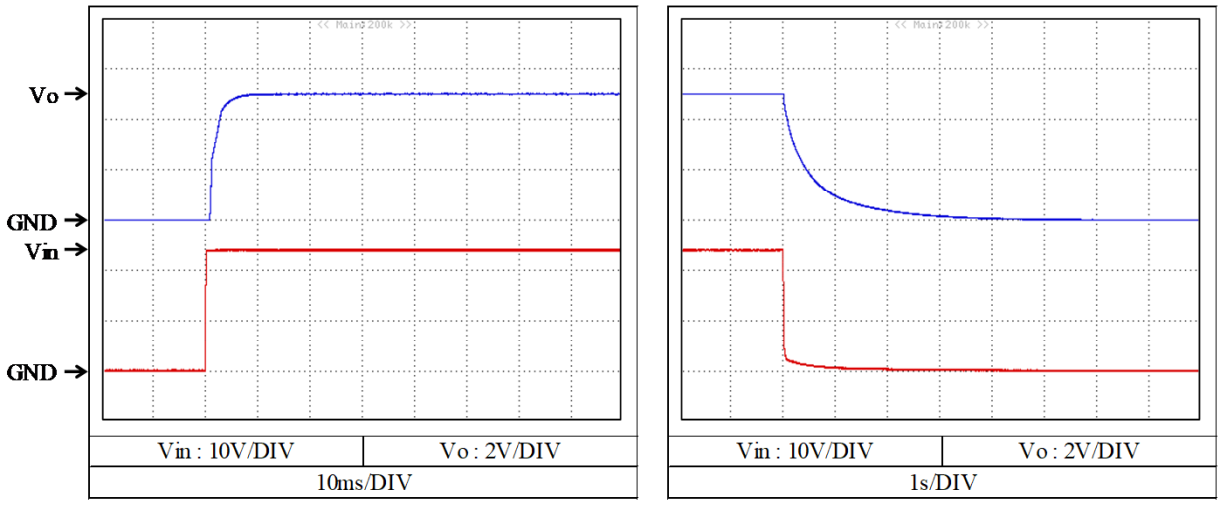
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 24 VDC
Io : 0 %
Ta : 25 °C

3.3V



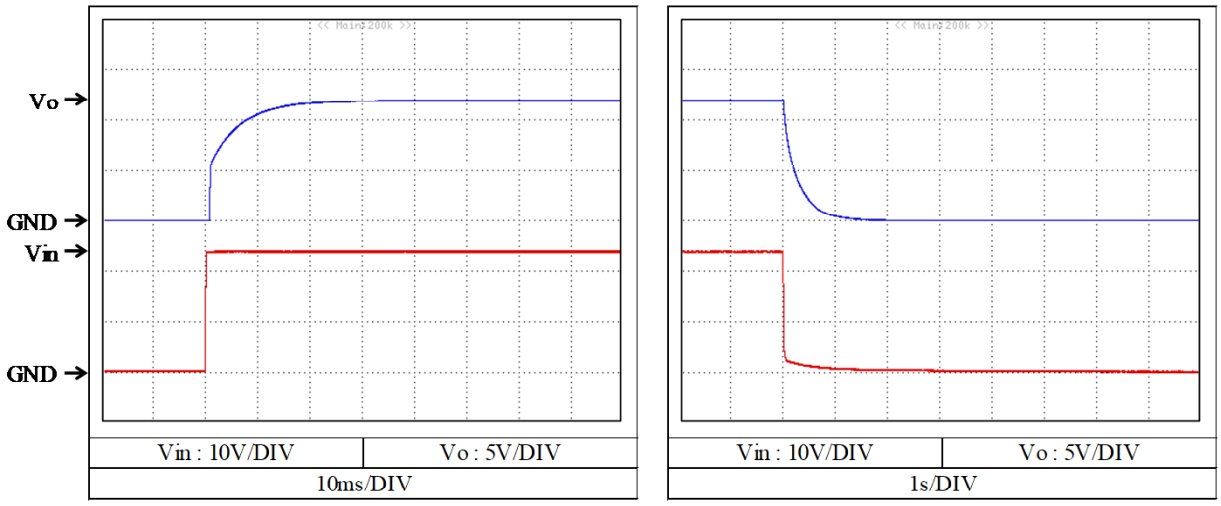
5V



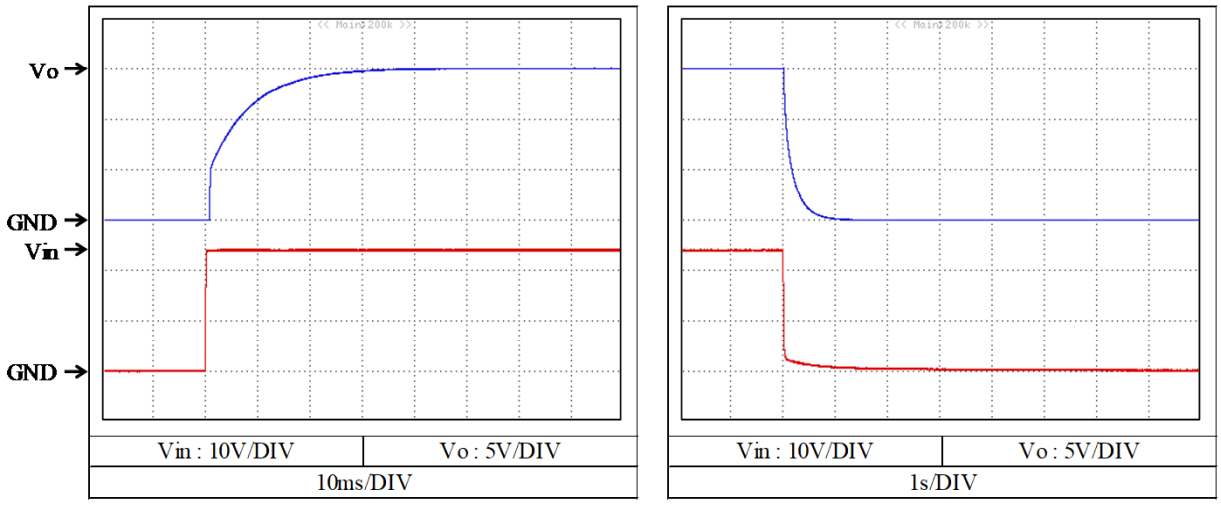
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 24 VDC
Io : 0 %
Ta : 25 °C

12V



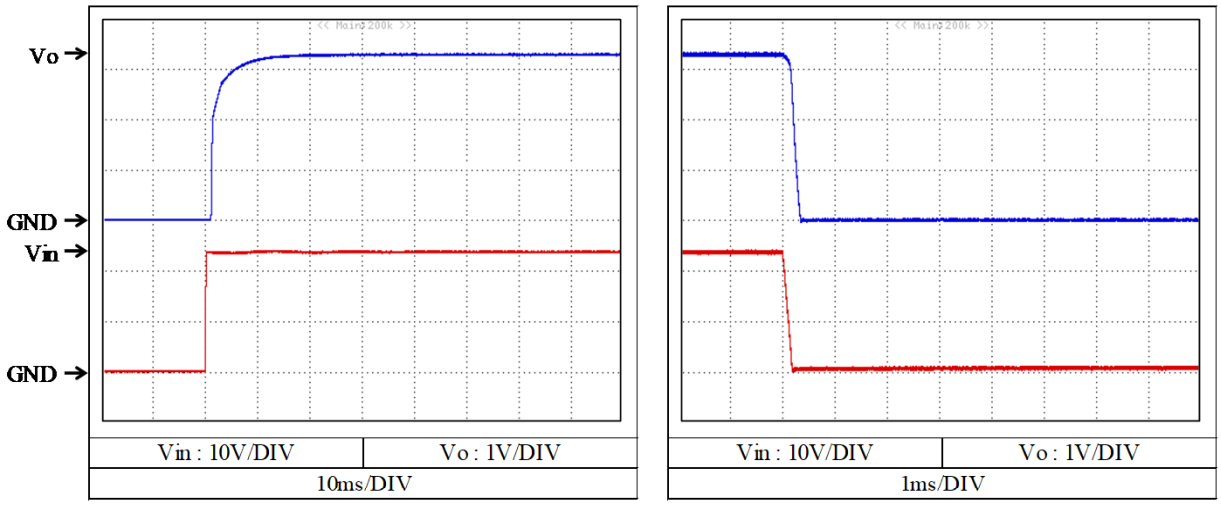
15V



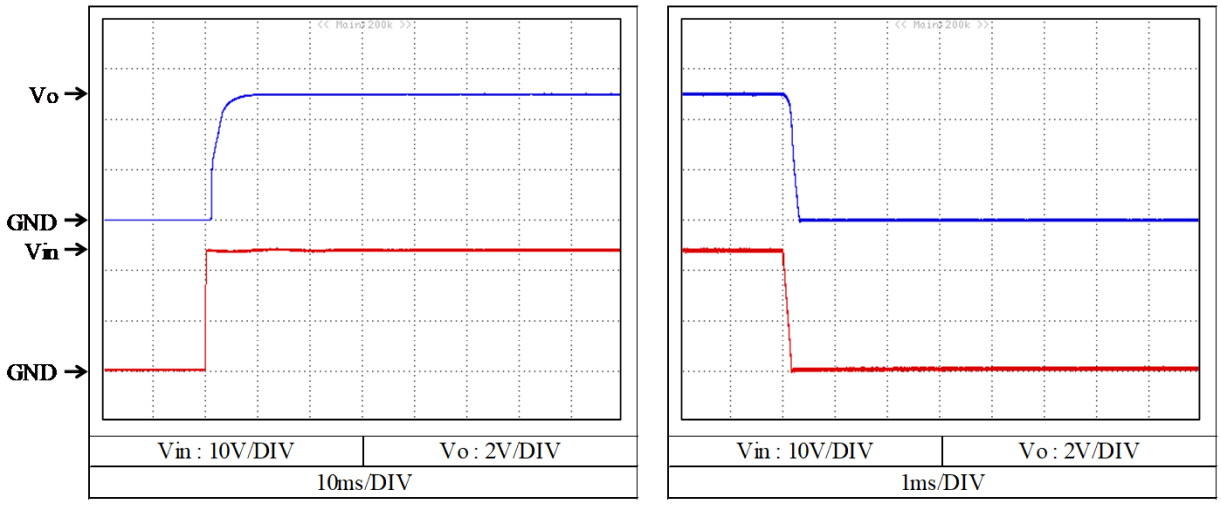
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

3.3V



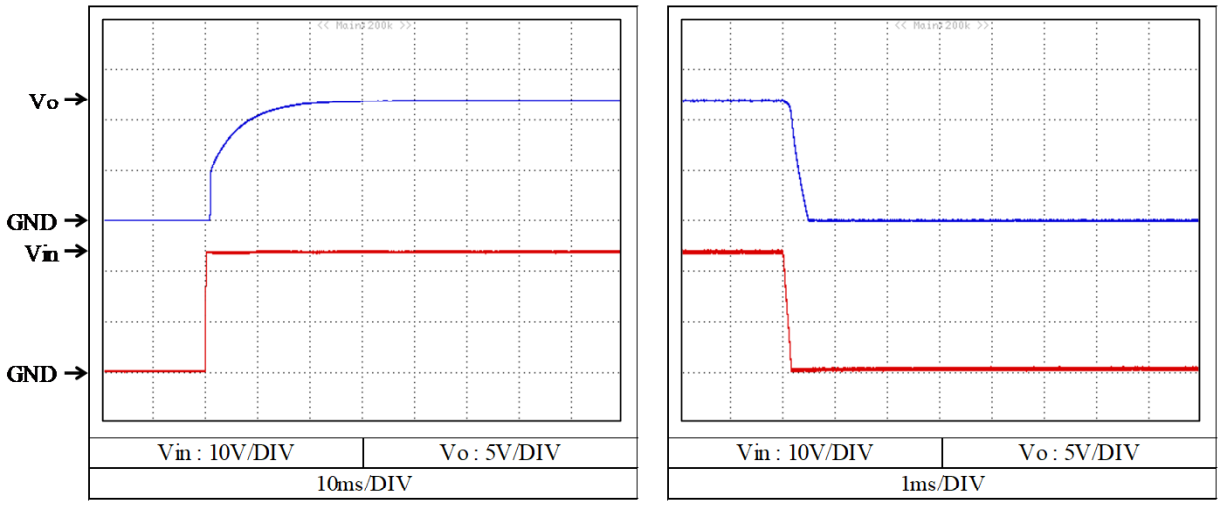
5V



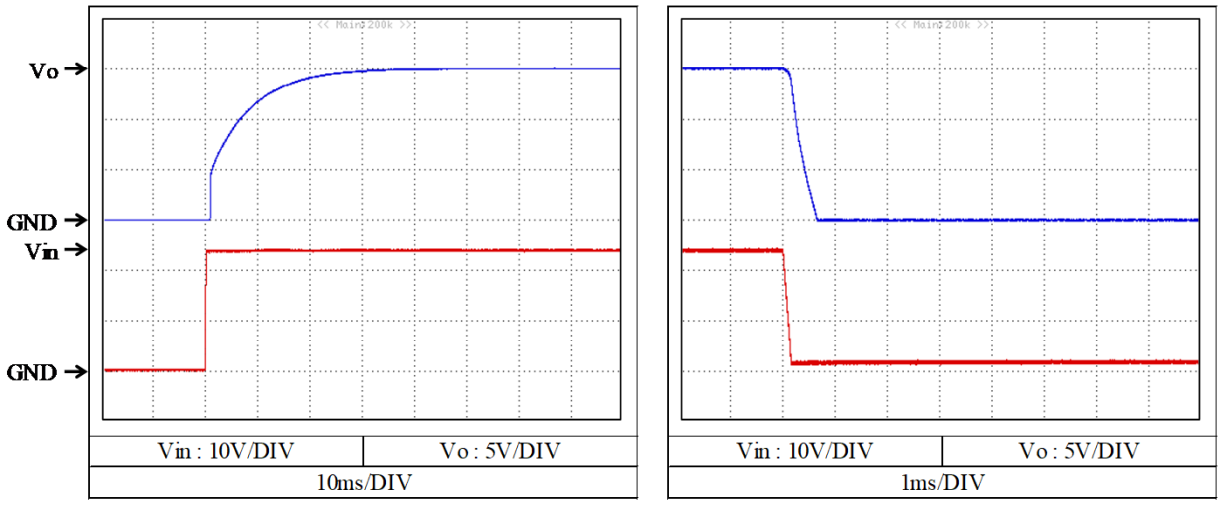
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

12V



15V

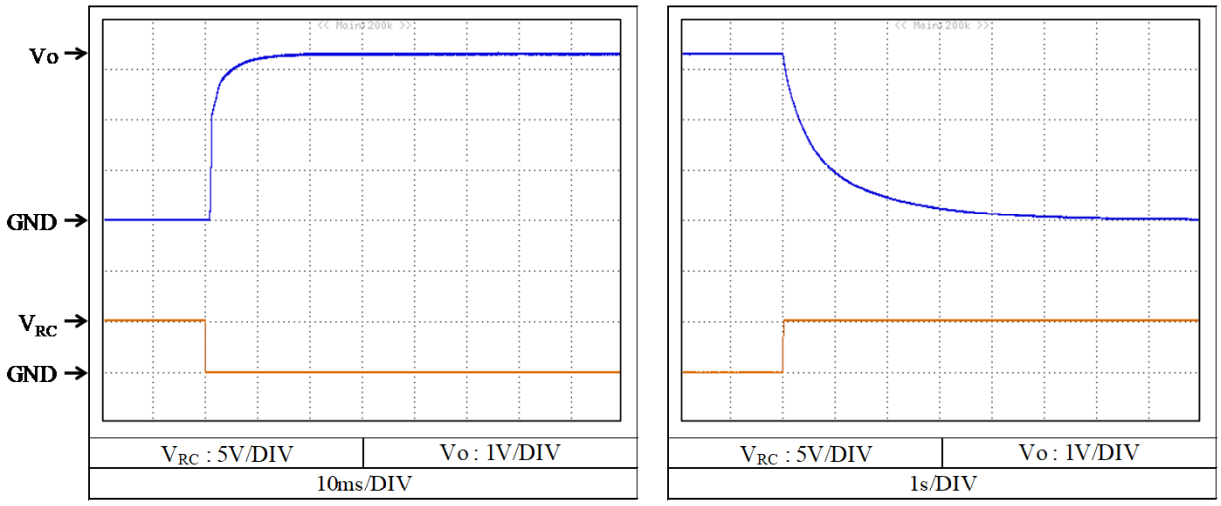


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

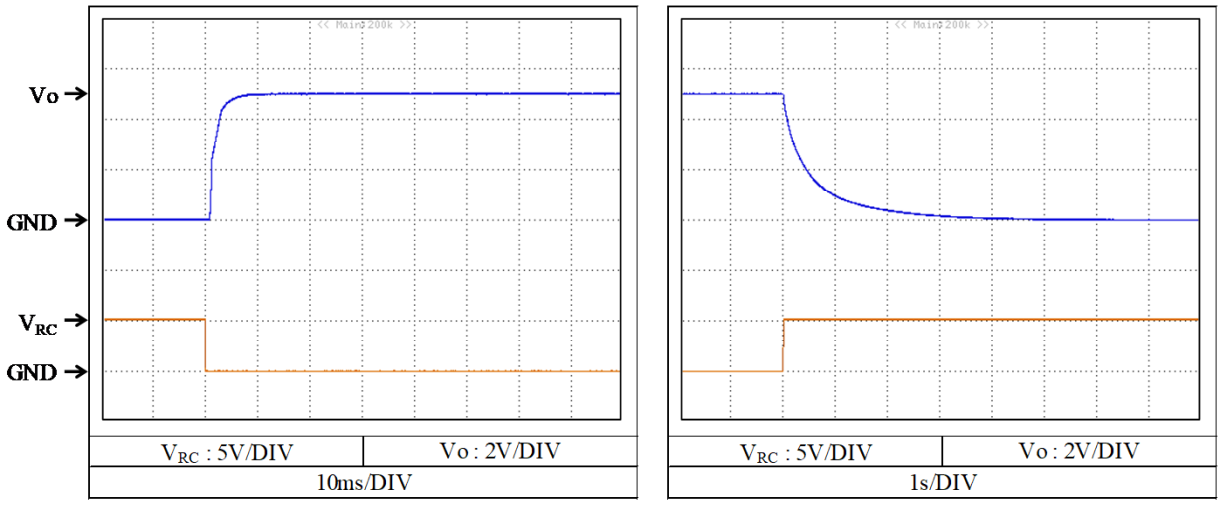
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 24 VDC
Io : 0 %
Ta : 25 °C

3.3V



5V

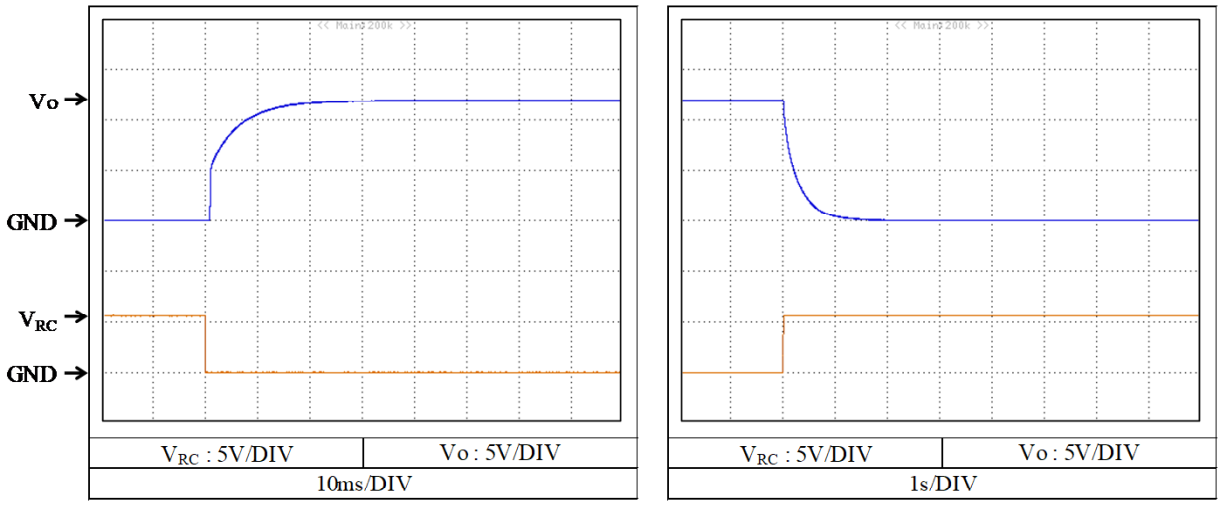


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

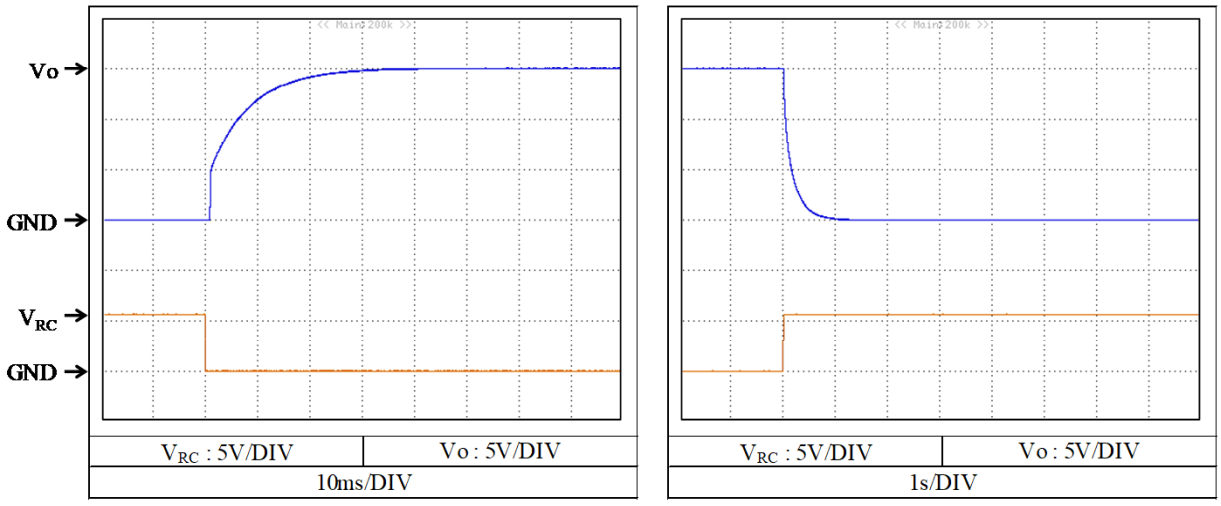
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 24 VDC
Io : 0 %
Ta : 25 °C

12V



15V

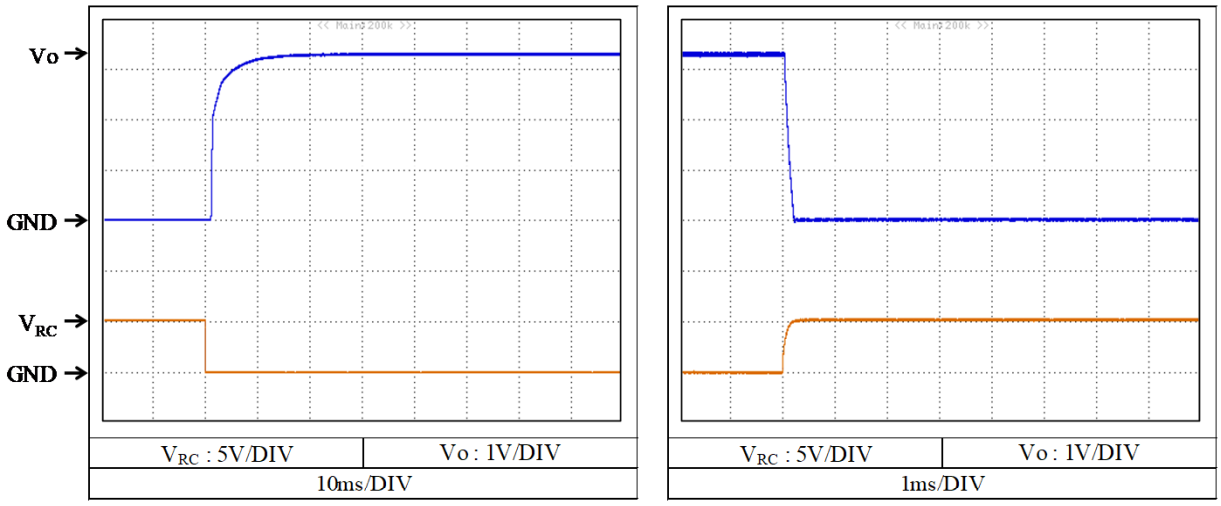


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

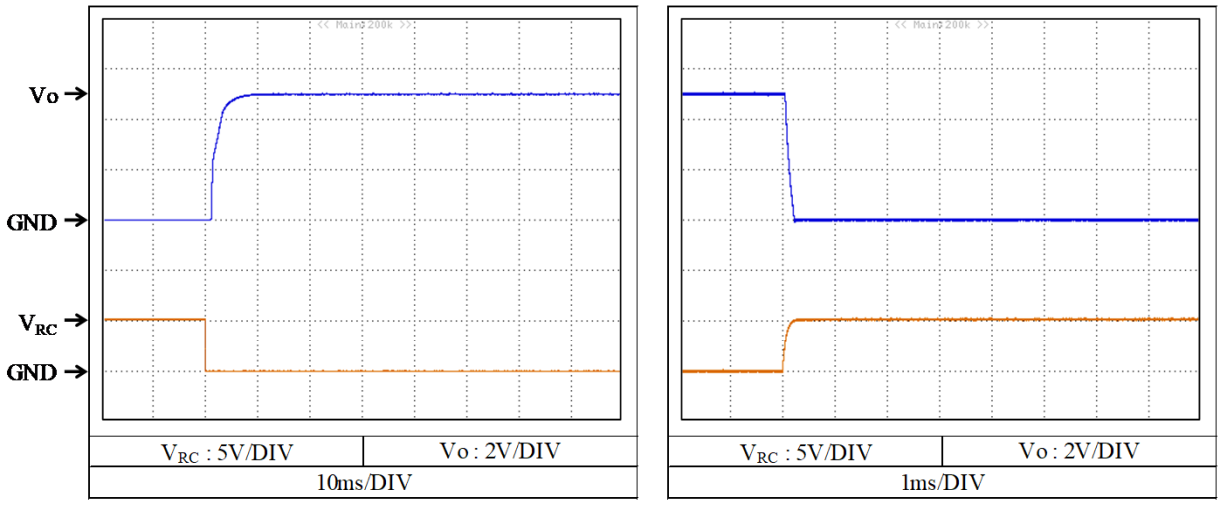
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

3.3V



5V

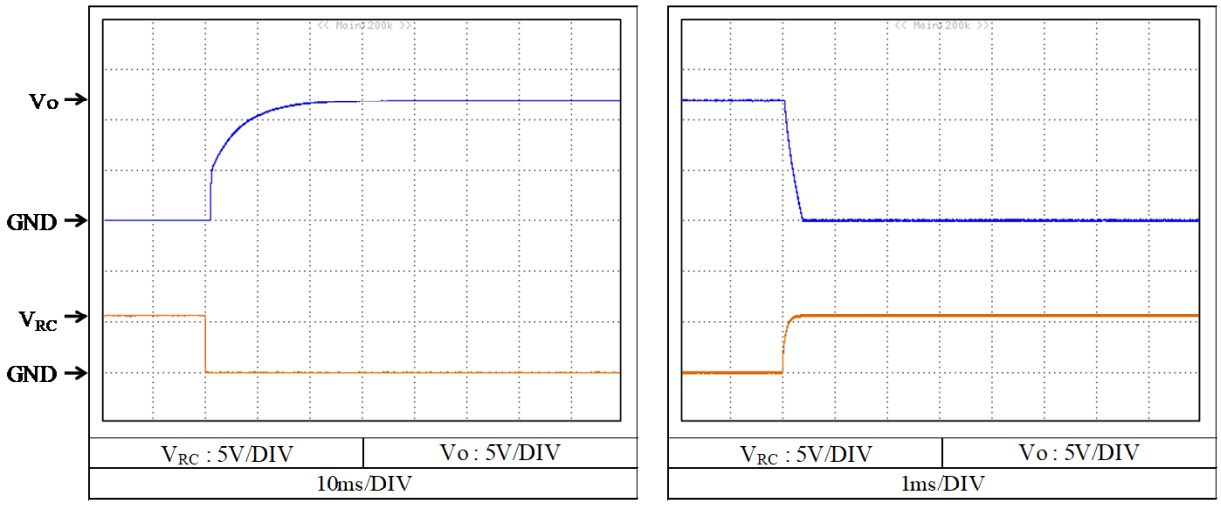


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

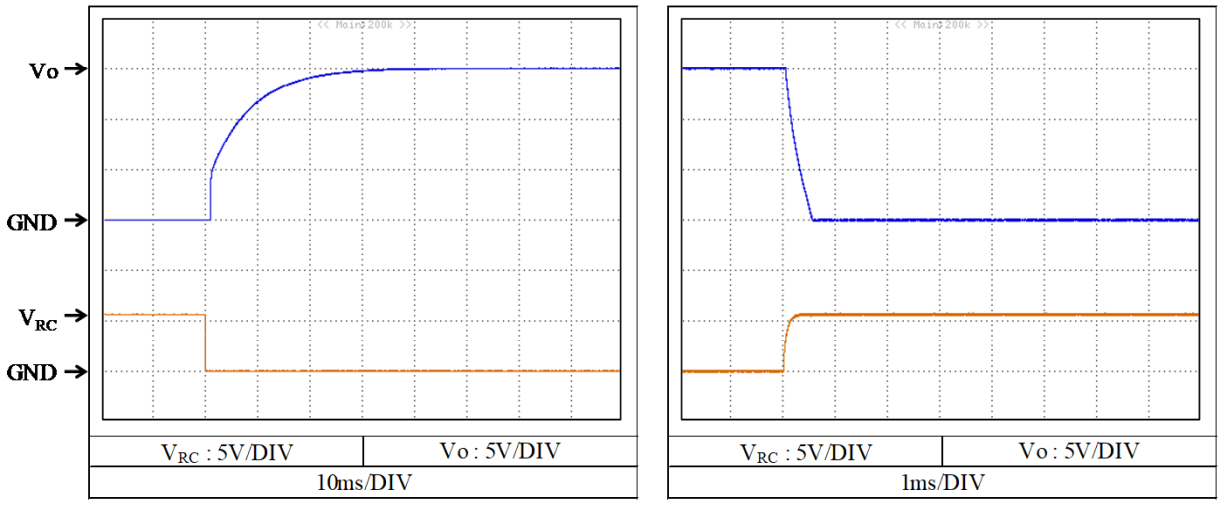
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

12V



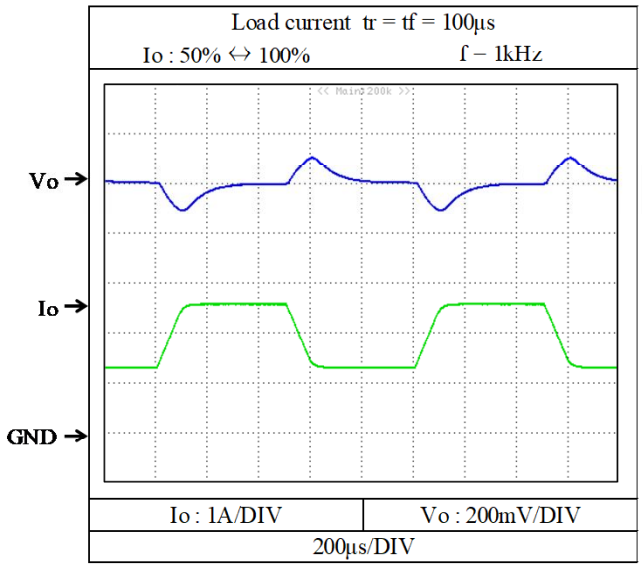
15V



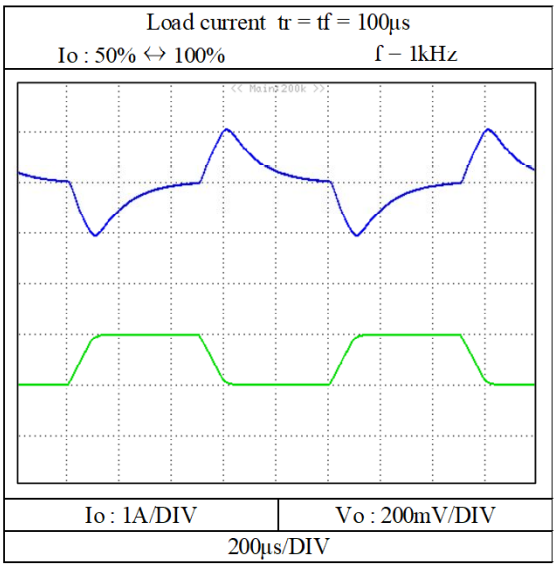
2-6. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions Vin : 24 VDC
Ta : 25 °C

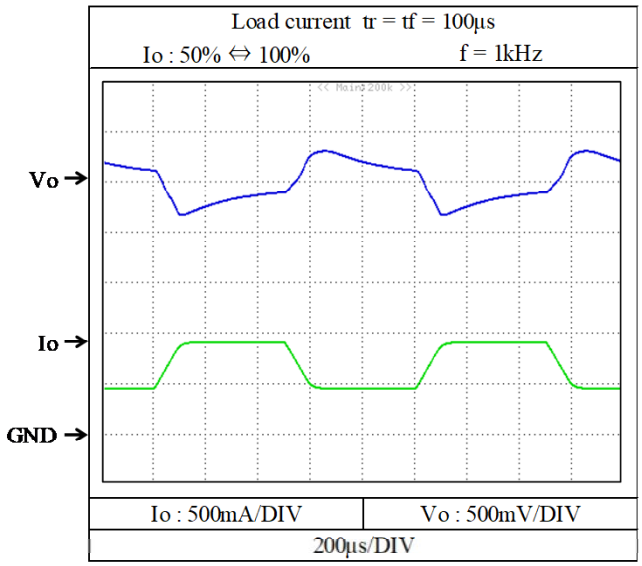
3.3V



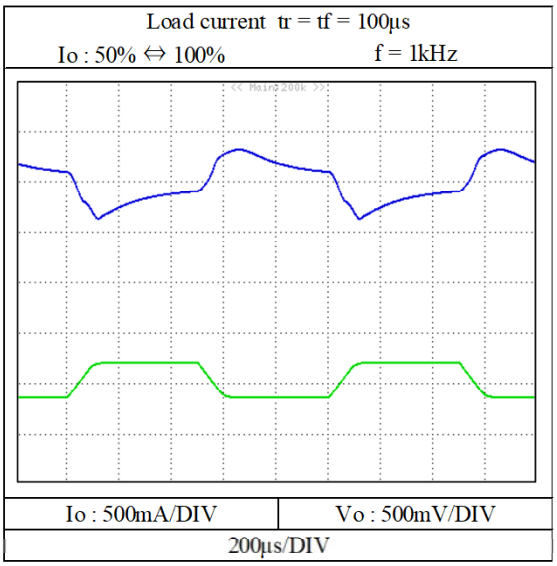
5V



12V



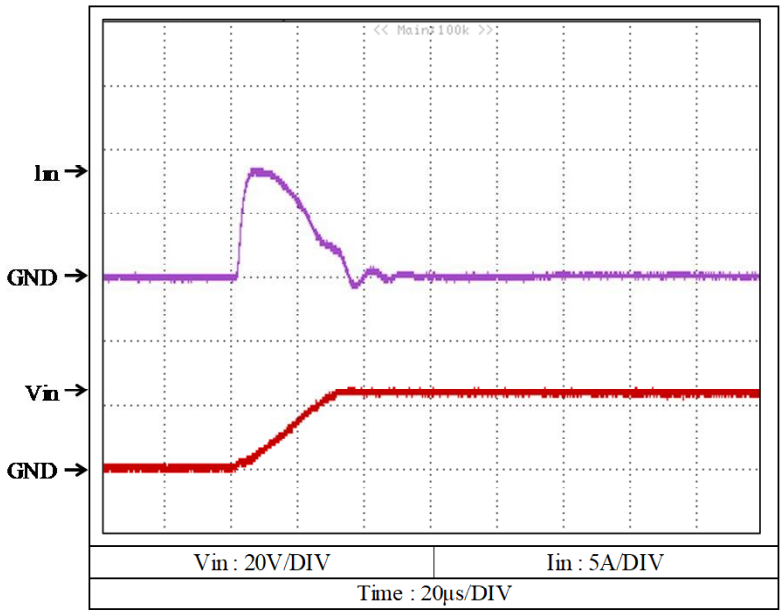
15V



2-7. 入力サージ電流(突入電流)特性 Inrush current characteristics

Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

CCG10-24-05S

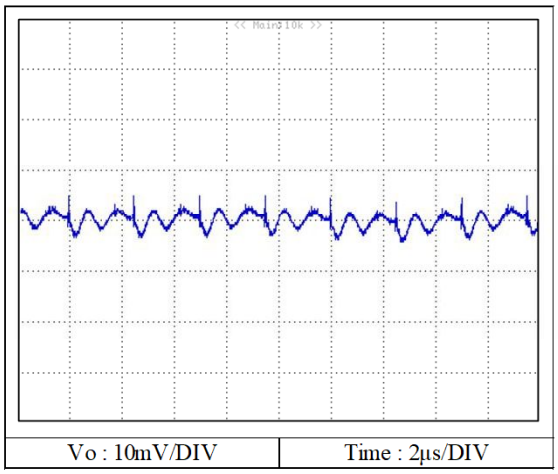


CCG10-24-xxSの入力サージ電流特性は CCG10-24-05S と同等です。
CCG10-24-xxS have the same Inrush current characteristics as CCG10-24-05S data.

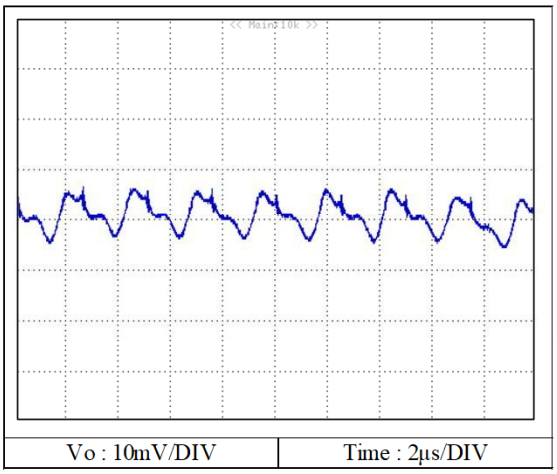
2-8. 出力リップルノイズ波形 Output ripple and noise waveform

Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

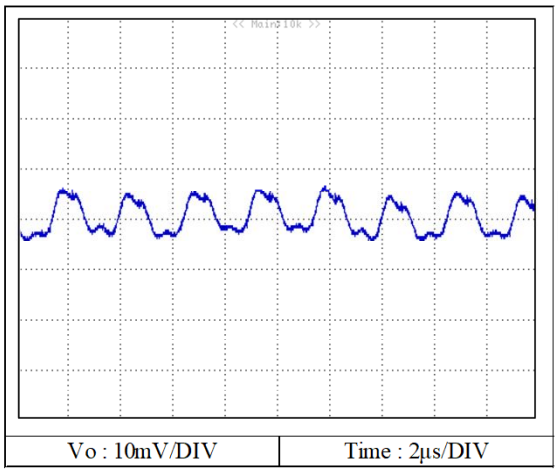
3.3V



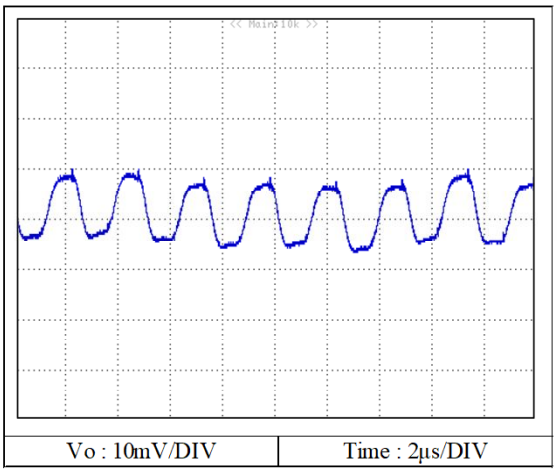
5V



12V



15V

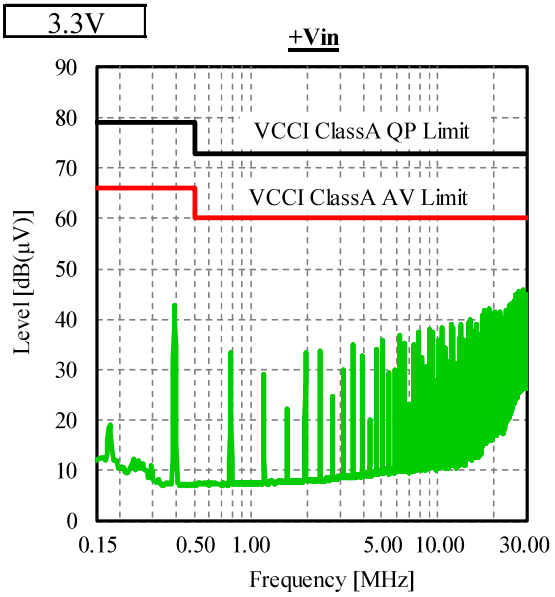


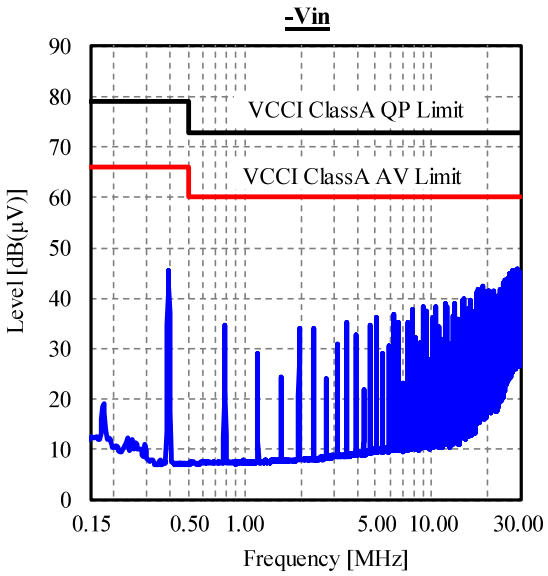
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

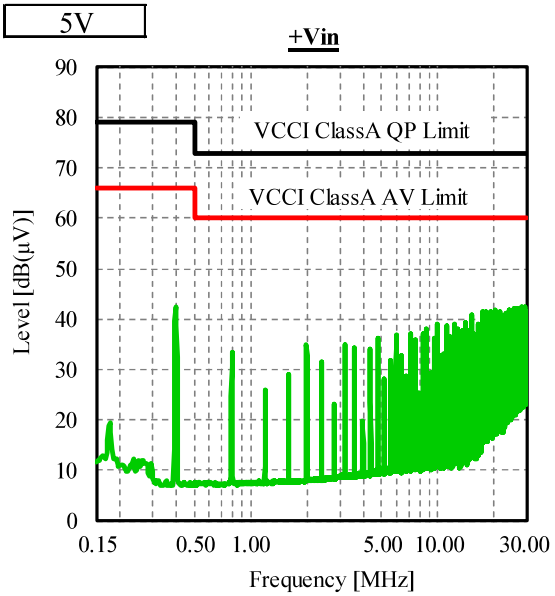
Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

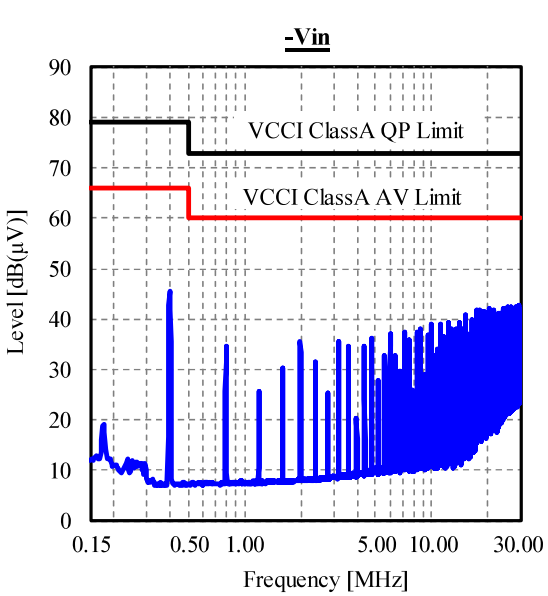
3.3V





5V





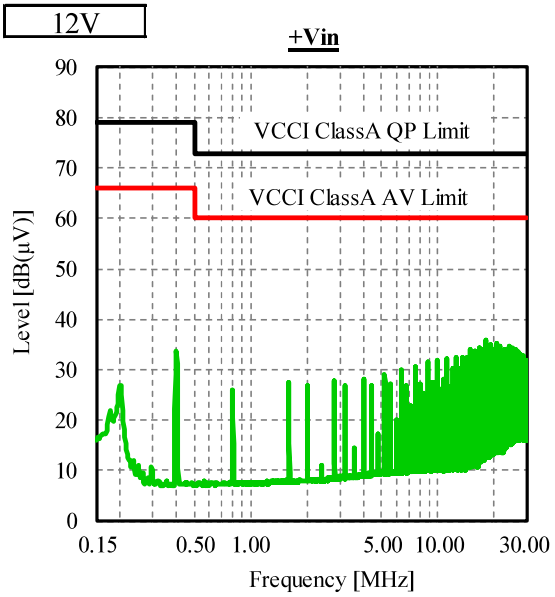
表示はQP値
Indication is QP values.

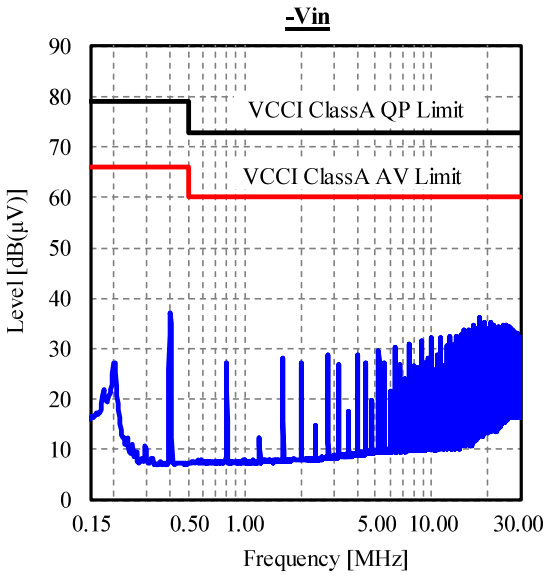
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

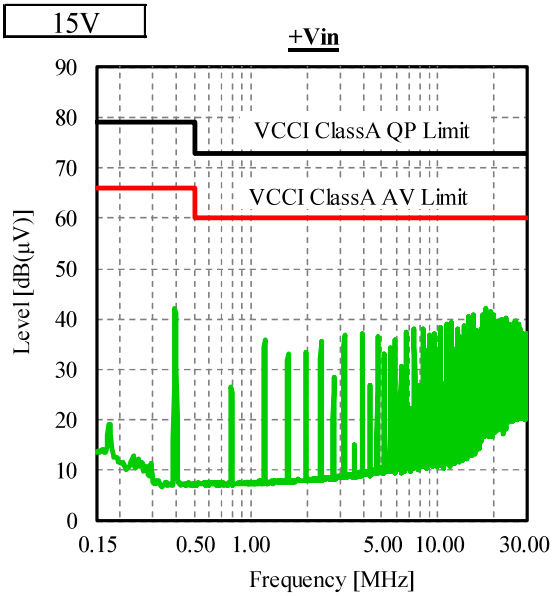
Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

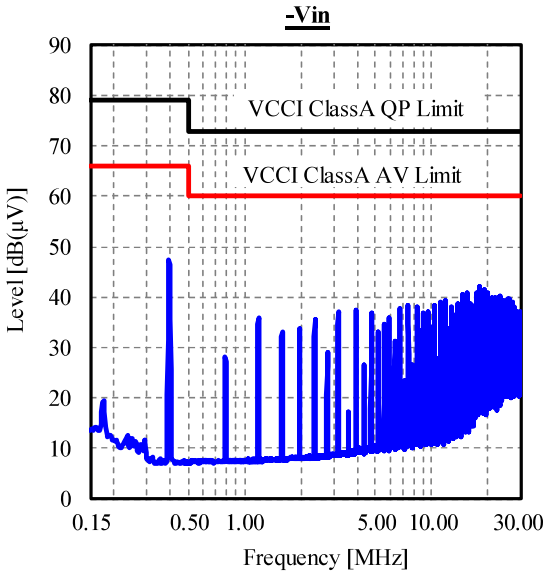
12V





15V





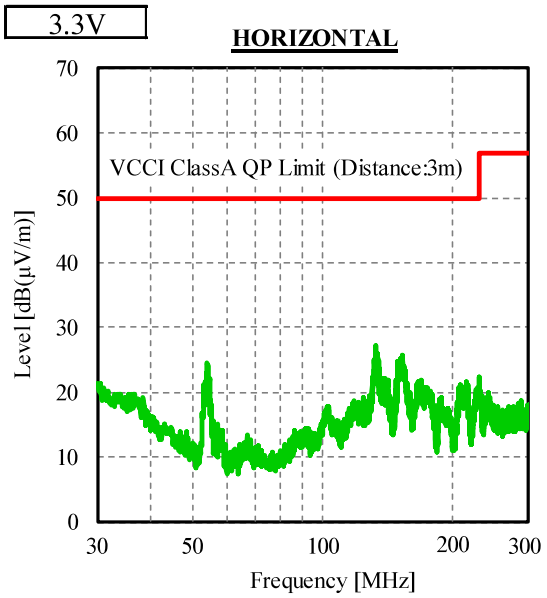
表示はQP値
Indication is QP values.

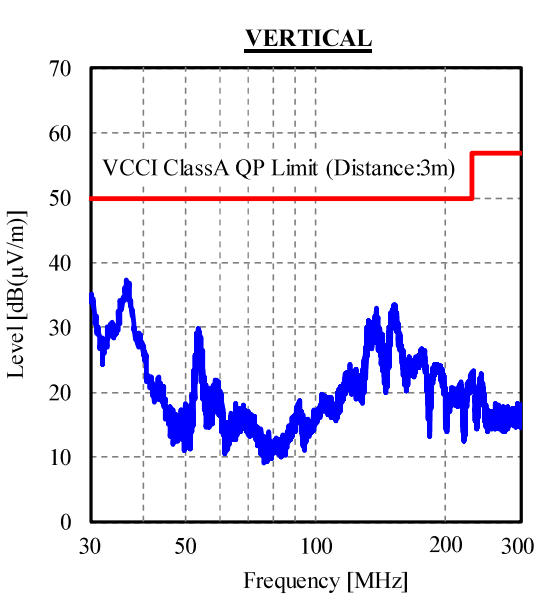
2-9. EMI特性 Electro-Magnetic Interference characteristics

(b) 雑音電界強度 (輻射ノイズ) Radiated Emission Noise

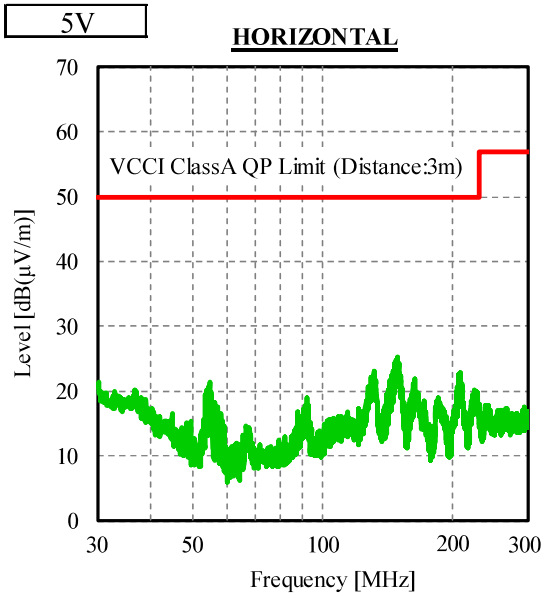
Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

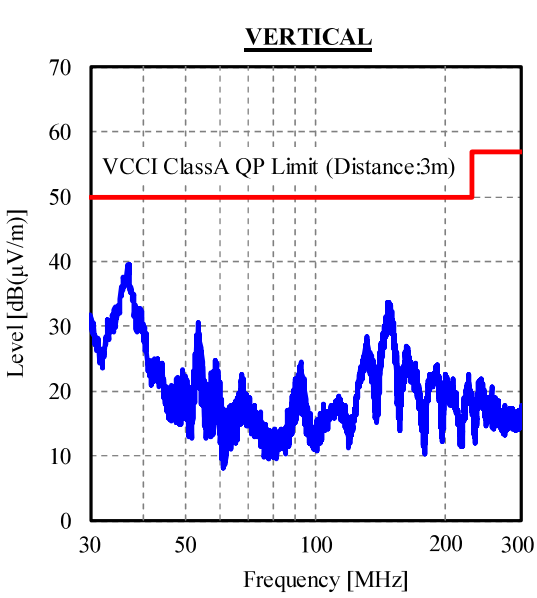
3.3V





5V





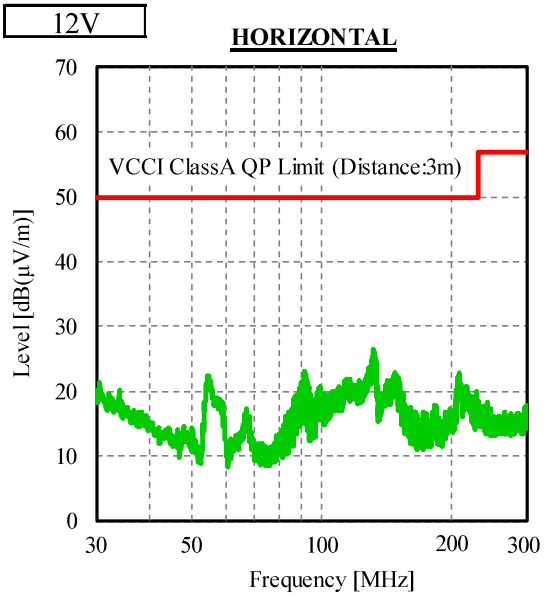
表示はピーク値
Indication is peak values.

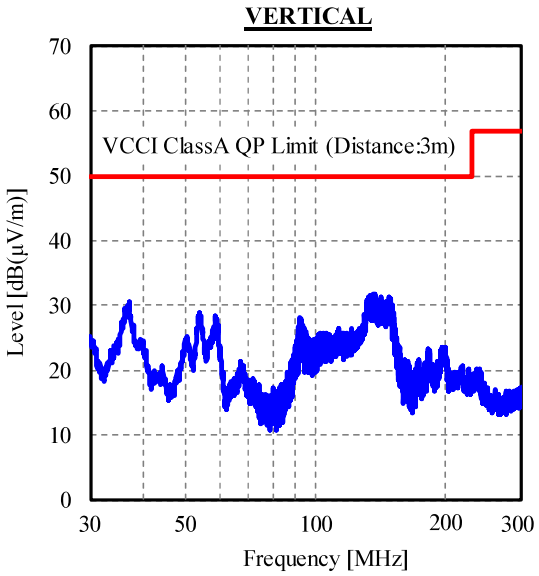
2-9. EMI特性 Electro-Magnetic Interference characteristics

(b) 雑音電界強度 (輻射ノイズ) Radiated Emission Noise

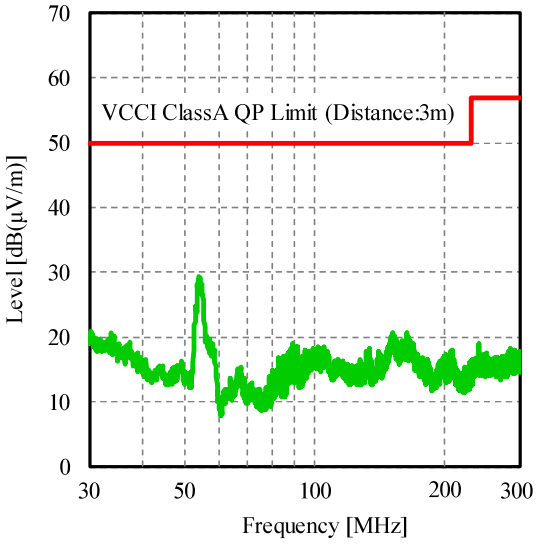
Conditions Vin : 24 VDC
Io : 100 %
Ta : 25 °C

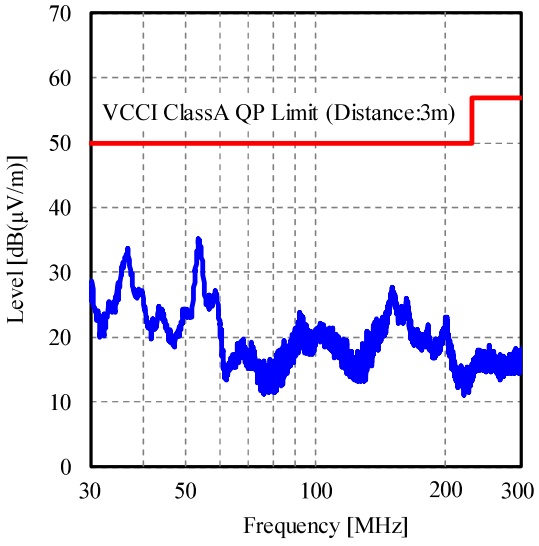
12V





15V





表示はピーク値
Indication is peak values.