CCG30-48-**D

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, -Vo	・・・・・	出力電圧	Output voltage
Vrc	・・・・・	RC電圧	RC voltage
Iin	・・・・・	入力電流	Input current
+Io, -Io	・・・・・	出力電流	Output current
Ta	・・・・・	周囲温度	Ambient temperature
f	・・・・・	周波数	Frequency

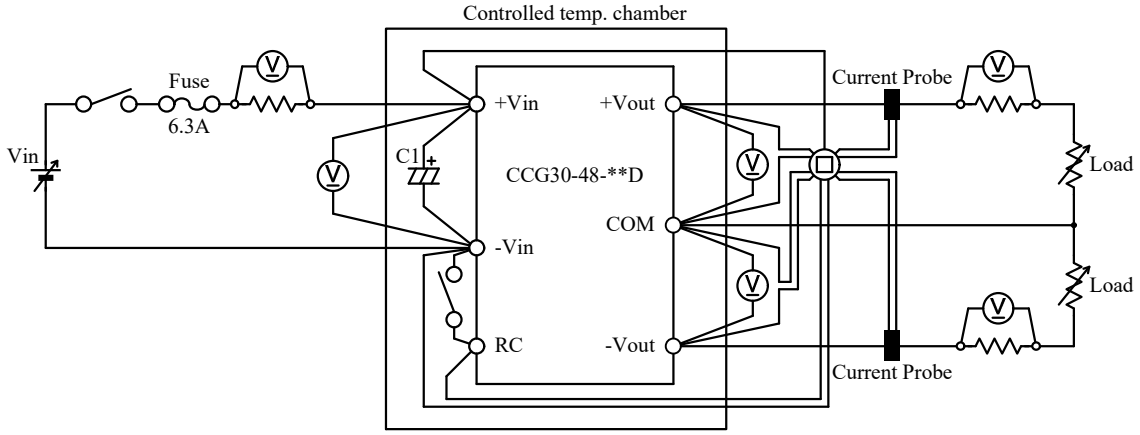
※ 当社測定条件における結果であり、参考値としてお考え願います。
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

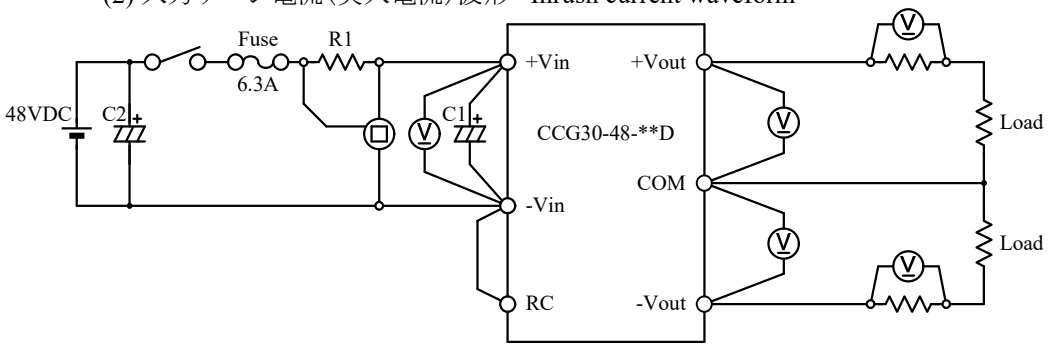
1-1. 測定回路 Measurement Circuits

(1) 静特性 、待機電力特性、通電ドリフト特性、その他特性

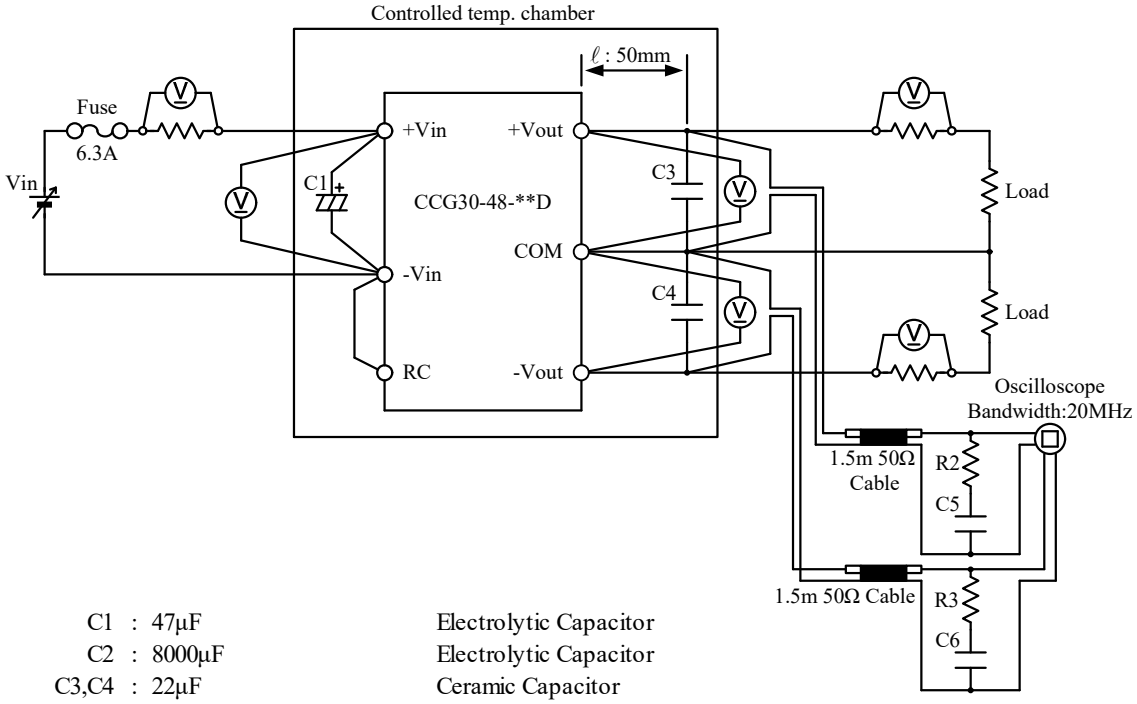
Steady state, Standby power, Warm up voltage drift and Other characteristics



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



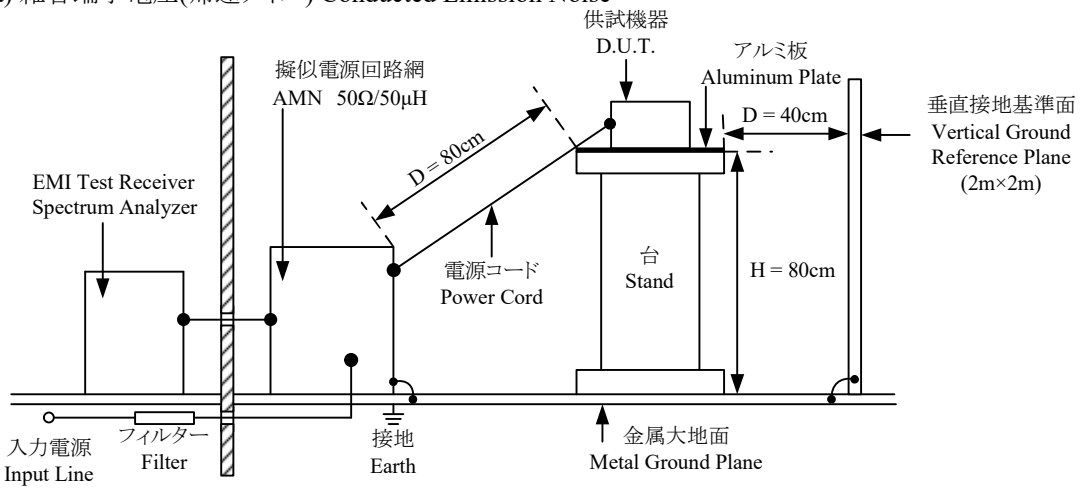
(3) 出力リップル、ノイズ電圧、波形 Output ripple and noise voltage and waveform



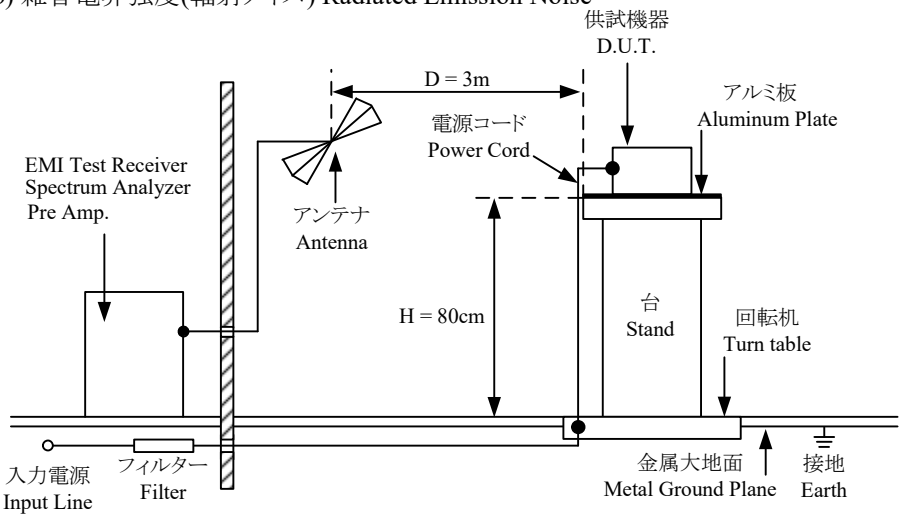
C1	: 47µF	Electrolytic Capacitor
C2	: 8000µF	Electrolytic Capacitor
C3,C4	: 22µF	Ceramic Capacitor
C5,C6	: 4700pF	Ceramic Capacitor
R1	: 0.01Ω	
R2,R3	: 50Ω	

(4) EMI特性　Electro-Magnetic Interference characteristics

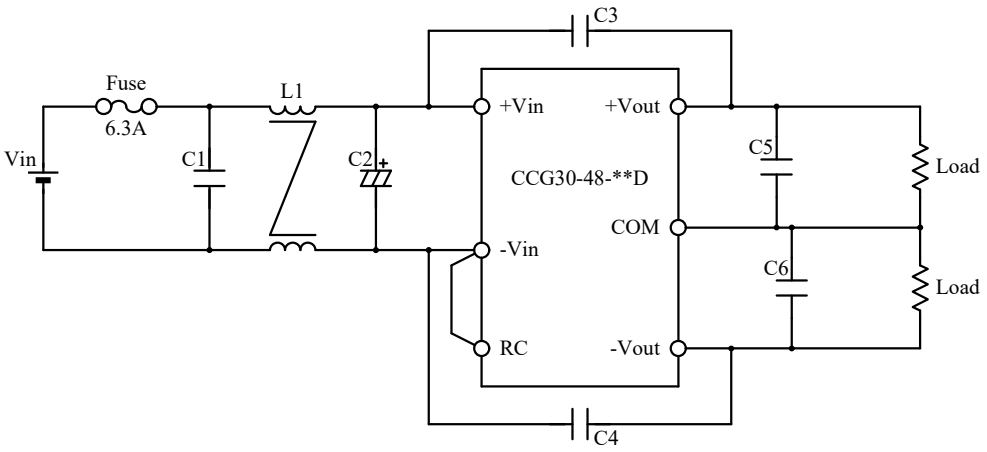
(a) 雑音端子電圧(帰還ノイズ) Conducted Emission Noise



(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	: 10μF	Ceramic Capacitor
C2	: 47μF	Electrolytic Capacitor
C3,C4	: 1000pF×2parallel	Ceramic Capacitor
C5,C6	: 22μF	Ceramic Capacitor
L1	: ACM1211-102-2PL (TDK)	Common Mode Choke Coil

1-2. 使用測定機器 List of equipment used

	EQUIPMENT USED	MANUFACTURER	MODEL NO.
1	DIGITAL STORAGE OSCILLOSCOPE	YOKOGAWA ELECT.	DL1740 / DL1740E
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	TAKASAGO	FK-200L / FK-600L
7	CVCF	TAKASAGO	AA2000XG
8	CVCF	NF	ES1000S / ES10000S
9	DC POWER SUPPLY	TDK-Lambda	Z+100-8
10	CONTROLLED TEMP. CHAMBER	ESPEC	SU-261 / SU-641
11	EMI TEST RECEIVER / SPECTRUM ANALYZER	ROHDE & SCHWARZ	ESCI
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

±12V 1. Regulation - line and load Condition Ta : 25 ºC

・+Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	12.046V	12.050V	12.048V	12.052V	6mV	0.050%
50%	12.072V	12.073V	12.071V	12.069V	4mV	0.033%
100%	12.078V	12.074V	12.070V	12.068V	10mV	0.083%
Load	32mV	24mV	23mV	17mV		
regulation	0.267%	0.200%	0.192%	0.142%		

・-Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	-12.060V	-12.059V	-12.062V	-12.056V	6mV	0.050%
50%	-12.031V	-12.033V	-12.034V	-12.034V	3mV	0.025%
100%	-12.025V	-12.031V	-12.036V	-12.035V	11mV	0.092%
Load	35mV	28mV	28mV	22mV		
regulation	0.292%	0.233%	0.233%	0.183%		

・+Vo to -Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	24.106V	24.109V	24.109V	24.108V	3mV	0.025%
50%	24.103V	24.105V	24.105V	24.103V	2mV	0.017%
100%	24.103V	24.105V	24.106V	24.104V	3mV	0.025%
Load	3mV	4mV	4mV	5mV		
regulation	0.025%	0.033%	0.033%	0.042%		

2. Temperature drift Conditions Vin : 48 VDC
Io : 100 %

Ta	-40°C	25°C	85°C	Temperature stability	
+Vo	12.044V	12.070V	12.092V	48mV	0.400%
-Vo	-12.015V	-12.036V	-12.055V	40mV	0.333%
+Vo to -Vo	24.059V	24.106V	24.147V	88mV	0.733%

3. Load Regulation - Unbalance load Conditions Ta : 25 ºC

・-Io : 100%

+Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%	12.321V	12.319V	12.317V	12.319V
100%	12.123V	12.119V	12.117V	12.116V
Load	198mV	200mV	200mV	203mV
regulation	1.650%	1.667%	1.667%	1.692%

・+Io : 100%

-Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%	-12.222V	-12.224V	-12.225V	-12.220V
100%	-12.044V	-12.049V	-12.051V	-12.048V
Load	178mV	175mV	174mV	172mV
regulation	1.483%	1.458%	1.450%	1.433%

±15V 1. Regulation - line and load Condition Ta : 25 ºC

・+Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	15.178V	15.175V	15.171V	15.172V	7mV	0.047%
50%	15.183V	15.183V	15.180V	15.178V	5mV	0.033%
100%	15.188V	15.184V	15.181V	15.177V	11mV	0.073%
Load	10mV	9mV	10mV	6mV		
regulation	0.067%	0.060%	0.067%	0.040%		

・-Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	-15.171V	-15.176V	-15.177V	-15.173V	6mV	0.040%
50%	-15.163V	-15.164V	-15.163V	-15.161V	3mV	0.020%
100%	-15.157V	-15.162V	-15.165V	-15.162V	8mV	0.053%
Load	14mV	14mV	14mV	12mV		
regulation	0.093%	0.093%	0.093%	0.080%		

・+Vo to -Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	30.349V	30.350V	30.348V	30.346V	4mV	0.027%
50%	30.346V	30.348V	30.343V	30.339V	9mV	0.060%
100%	30.345V	30.346V	30.346V	30.339V	7mV	0.047%
Load	4mV	4mV	5mV	7mV		
regulation	0.027%	0.027%	0.033%	0.047%		

2. Temperature drift Conditions Vin : 48 VDC
Io : 100 %

Ta	-40°C	25°C	85°C	Temperature stability	
+Vo	15.206V	15.181V	15.166V	40mV	0.267%
-Vo	-15.194V	-15.165V	-15.147V	47mV	0.313%
+Vo to -Vo	30.400V	30.346V	30.313V	87mV	0.580%

3. Load Regulation - Unbalance load Conditions Ta : 25 ºC

・-Io : 100%

+Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%	15.420V	15.413V	15.405V	15.398V
100%	15.218V	15.222V	15.224V	15.222V
Load	202mV	191mV	181mV	176mV
regulation	1.347%	1.273%	1.207%	1.173%

・+Io : 100%

-Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%	-15.358V	-15.353V	-15.363V	-15.369V
100%	-15.124V	-15.120V	-15.119V	-15.114V
Load	234mV	233mV	244mV	255mV
regulation	1.560%	1.553%	1.627%	1.700%

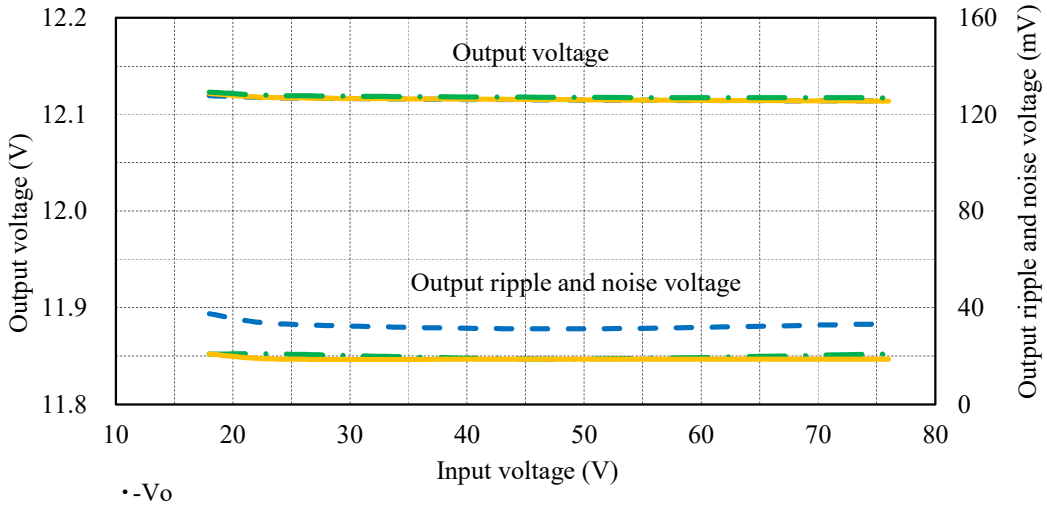
(2) 出力電圧・出力リップルノイズ電圧 対 入力電圧

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

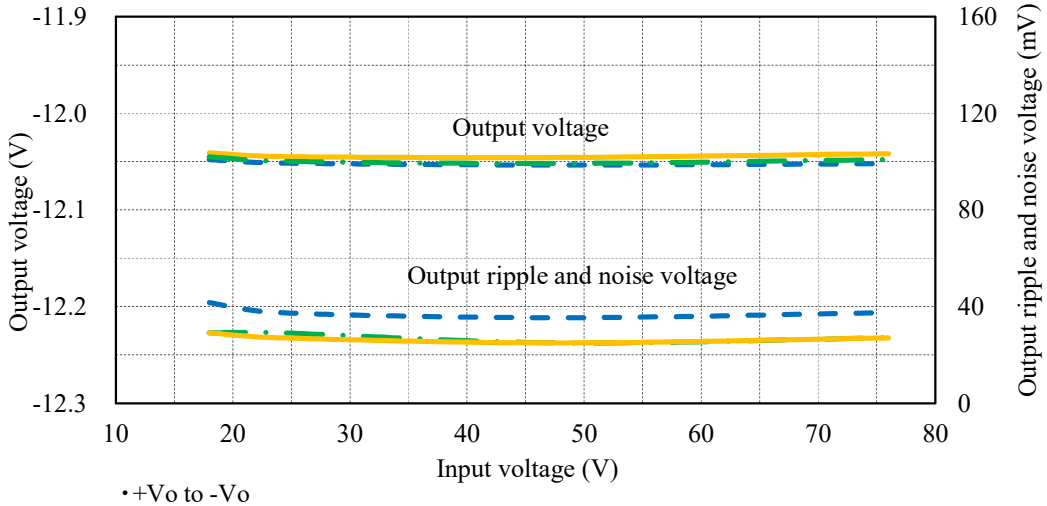
Conditions Io : 100 %
Ta : -40 ºC
: 25 ºC
: 85 ºC

±12V

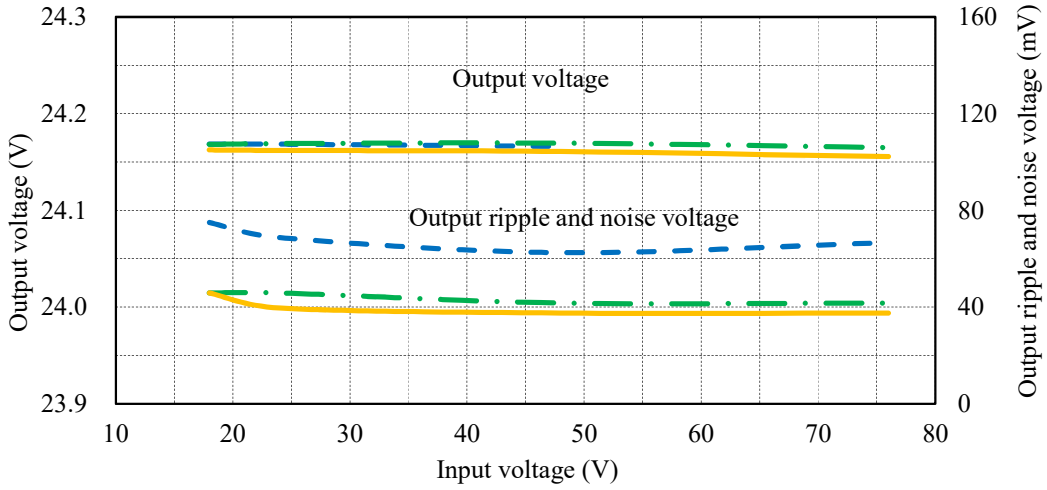
・+Vo



・-Vo



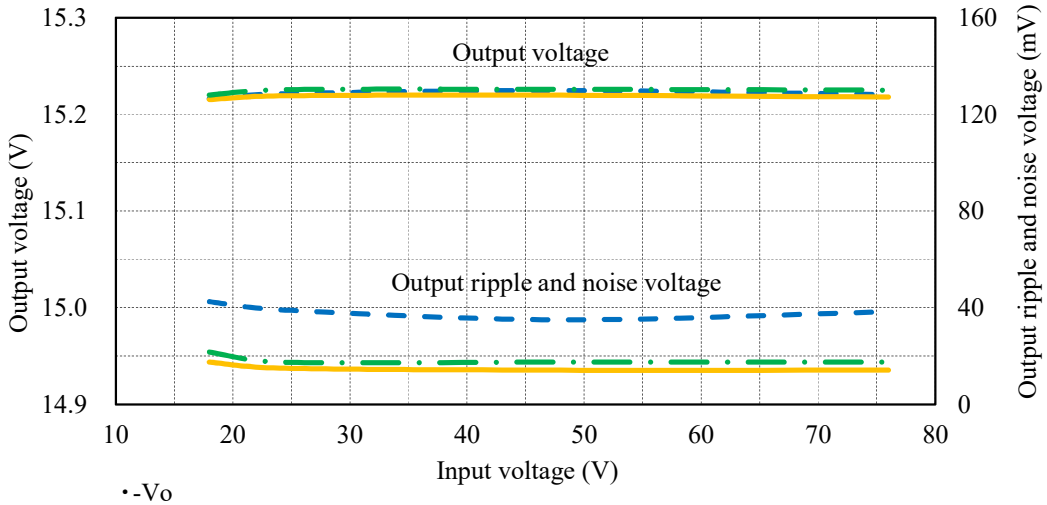
・+Vo to -Vo



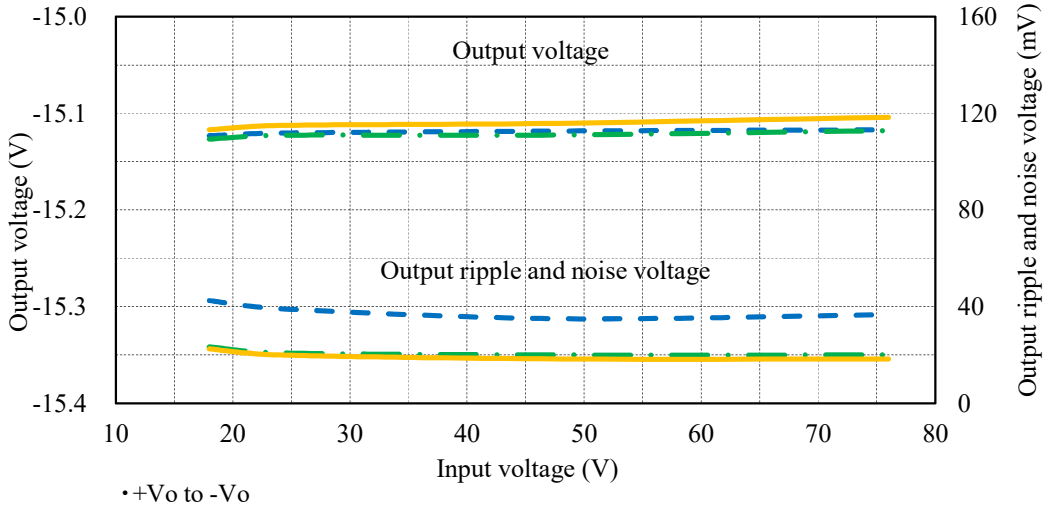
Conditions Io : 100 %
Ta : -40 ºC
: 25 ºC
: 85 ºC

±15V

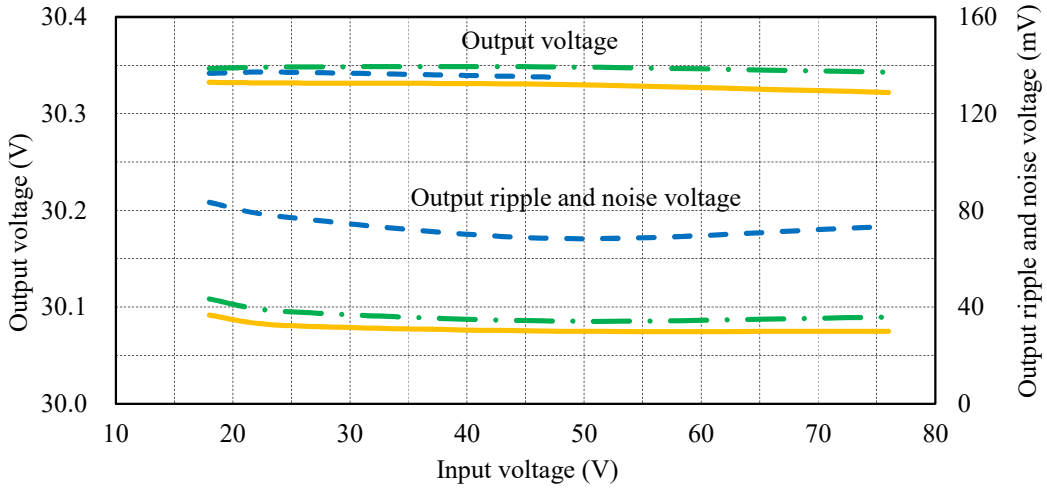
・+Vo



・-Vo



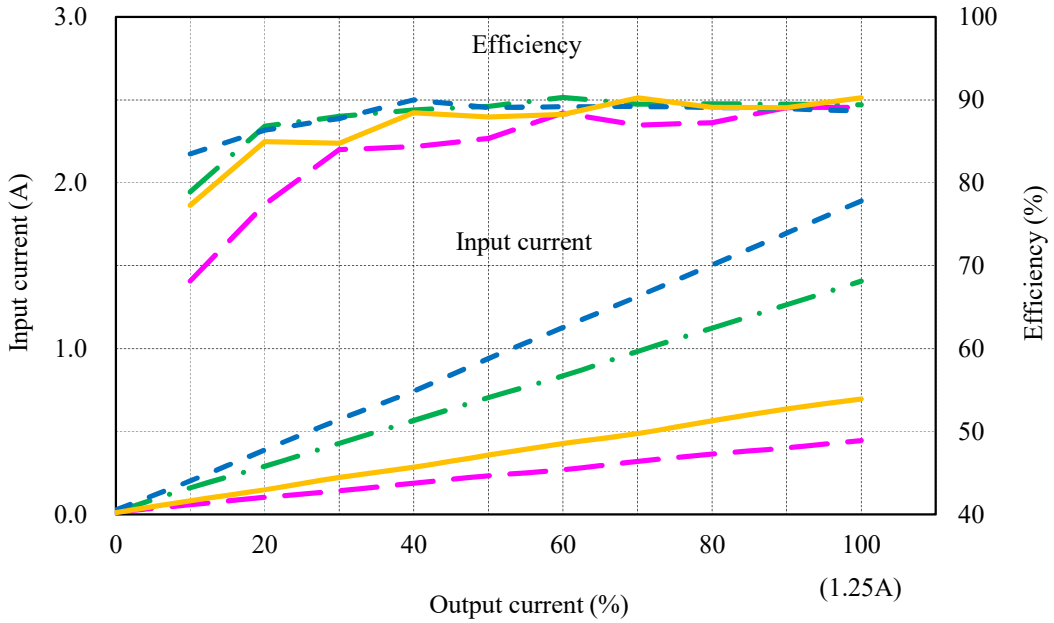
・+Vo to -Vo



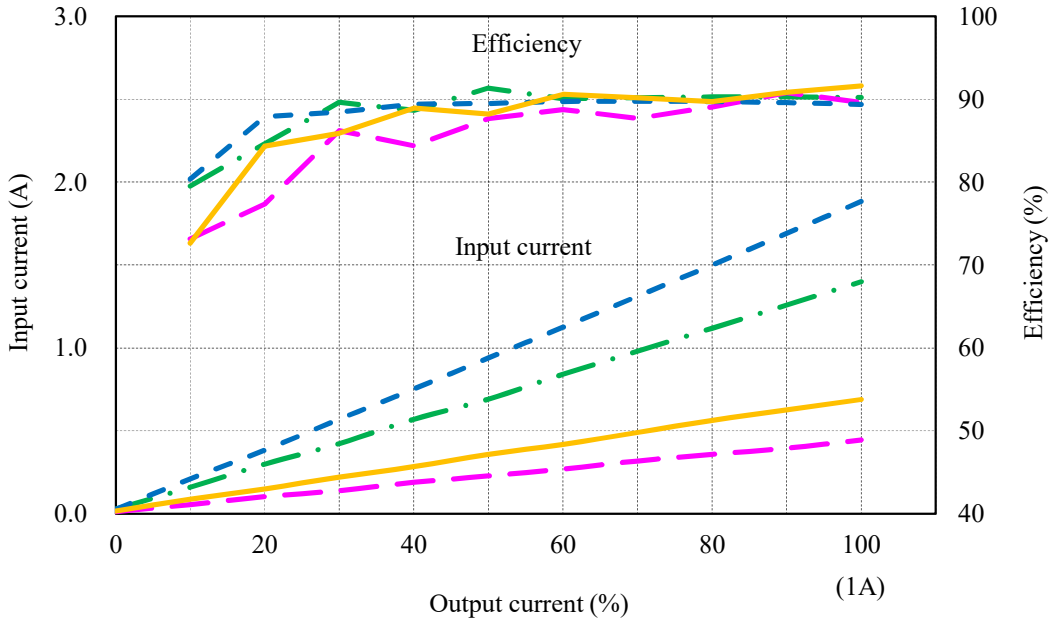
(3) 入力電流･効率 対 出力電流　Input current and Efficiency vs. Output current

Conditions　Vin　:　18 VDC
:　24 VDC
:　48 VDC
:　76 VDC
Ta　:　25 ºC

±12V



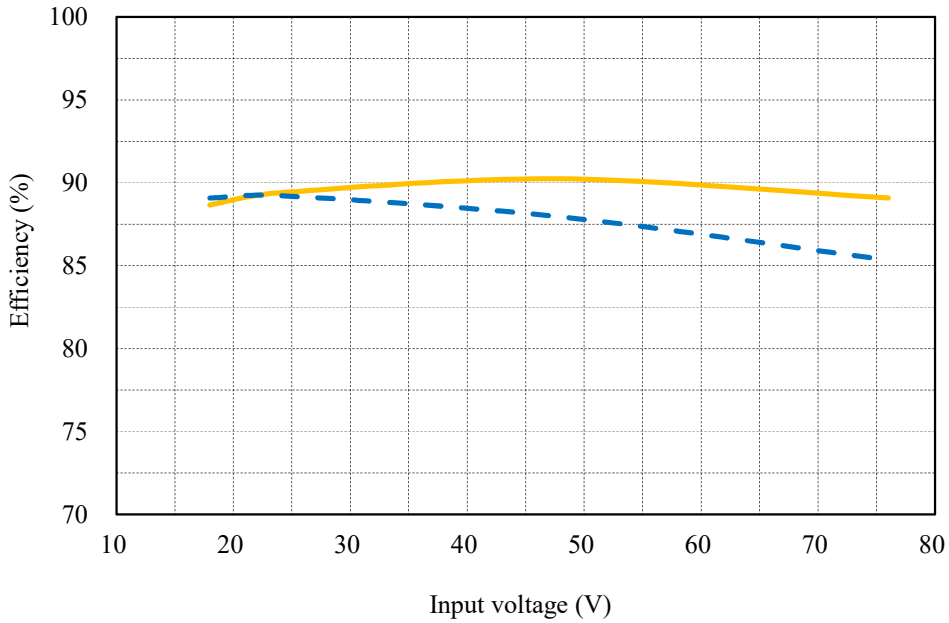
±15V



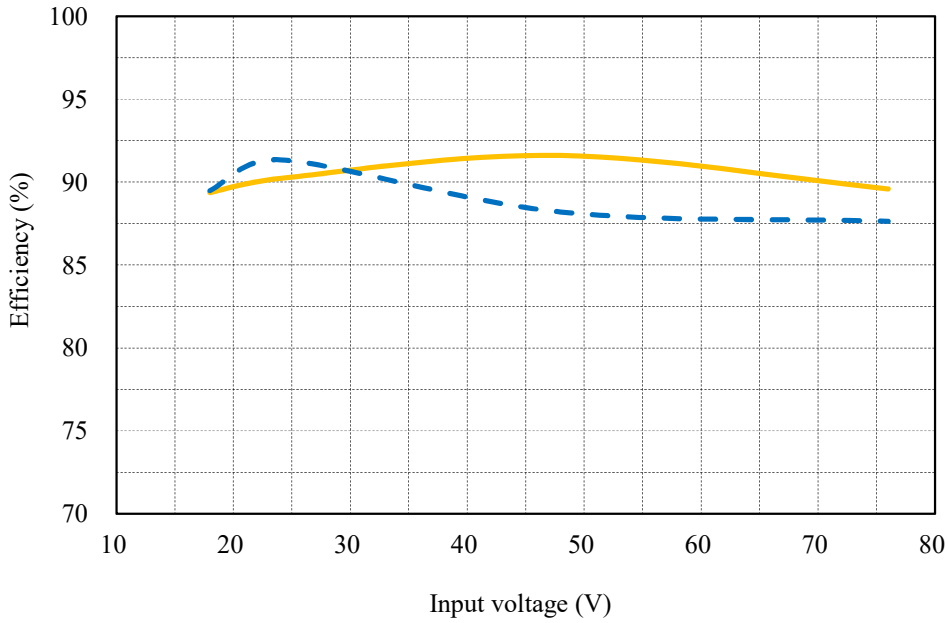
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

Conditions Io : 50 %
: 100 %
Ta : 25 ºC

±12V



±15V



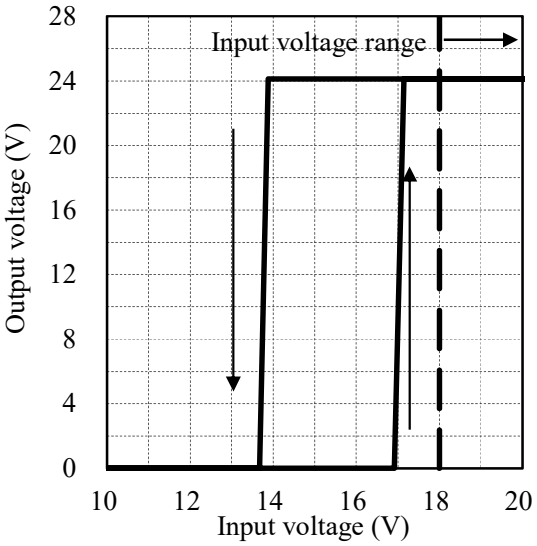
(5) 起動・遮断電圧特性 Start up and Drop out voltage characteristics

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

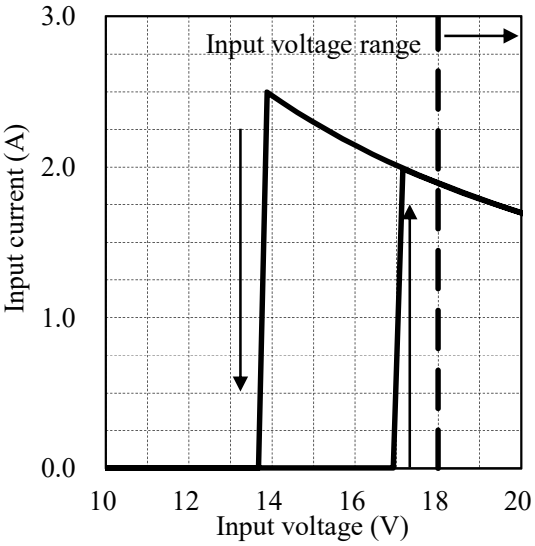
入力電流 対 入力電圧
Input current vs. Input voltage

Conditions Io : 100 %
Ta : 25 ºC

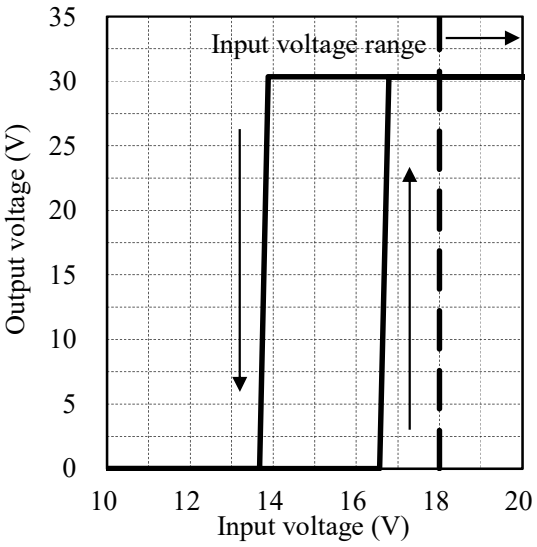
±12V



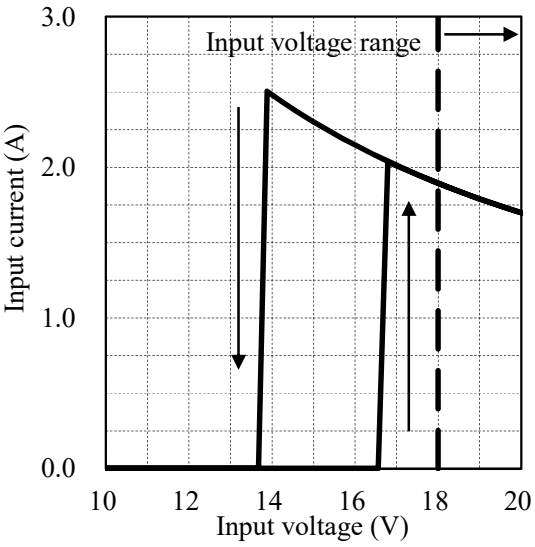
±12V



±15V



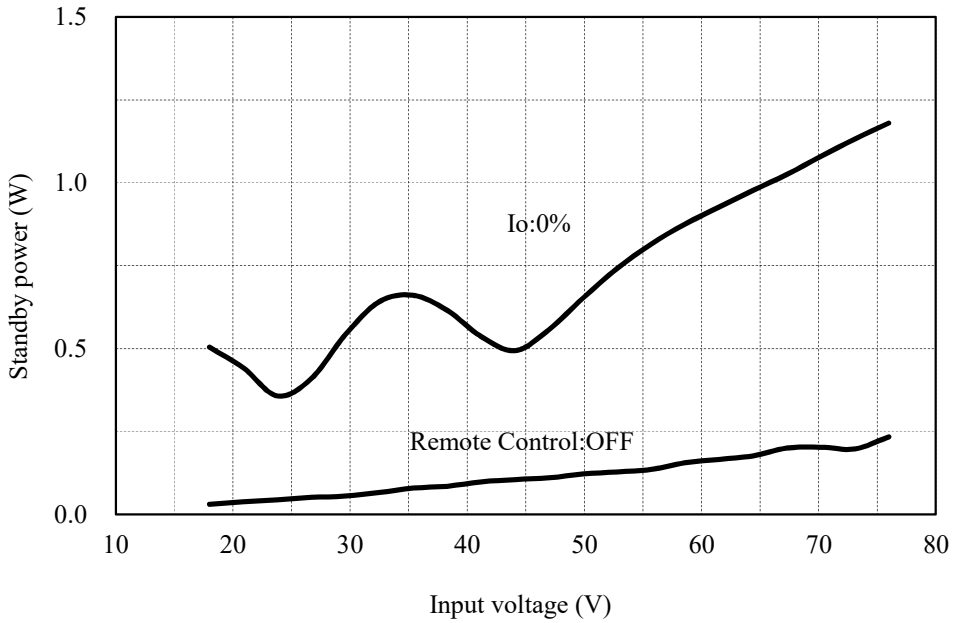
±15V



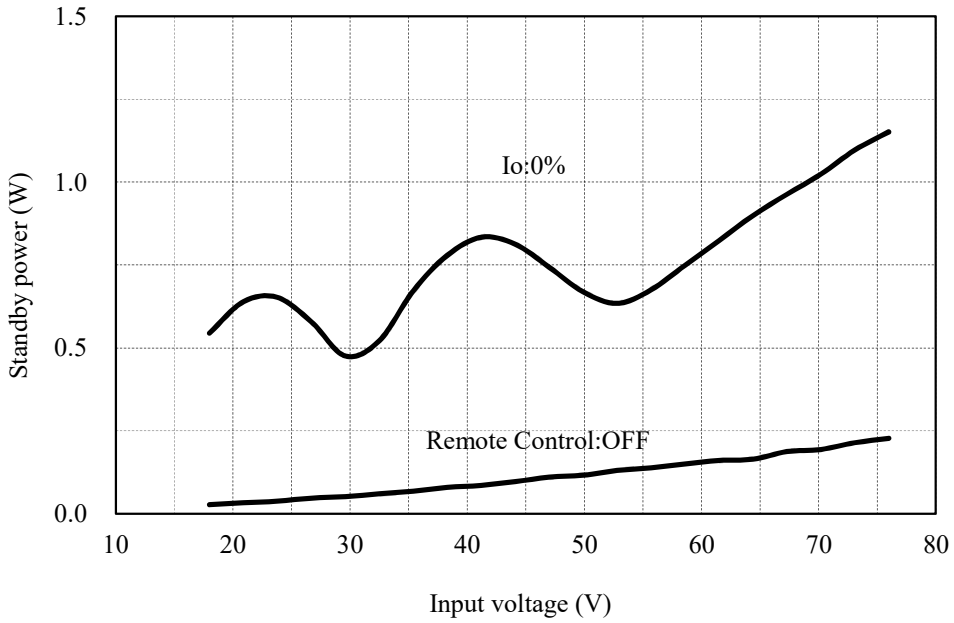
2-2. 待機電力特性 Standby power characteristics

Conditions Ta : 25 ºC

±12V



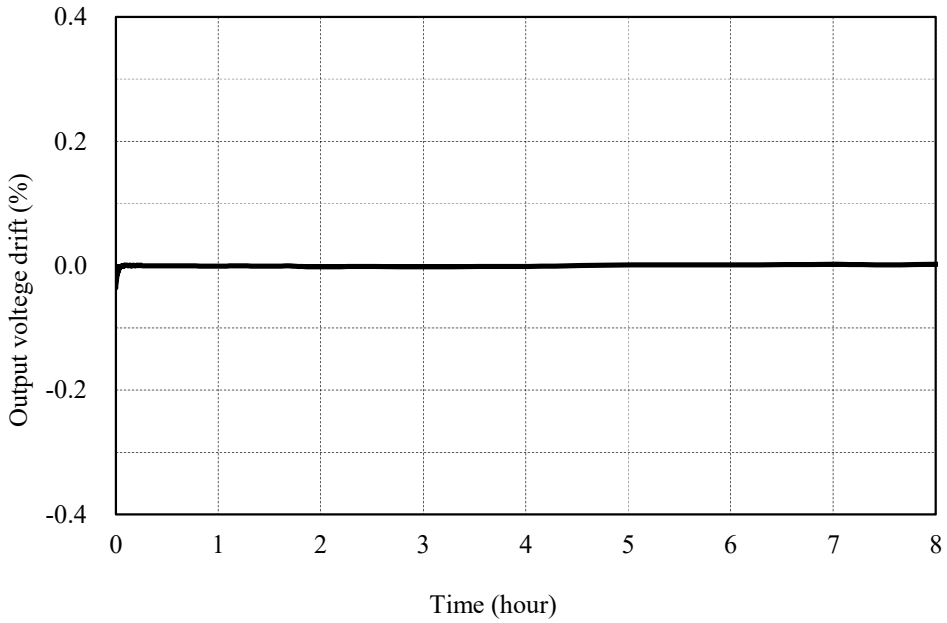
±15V



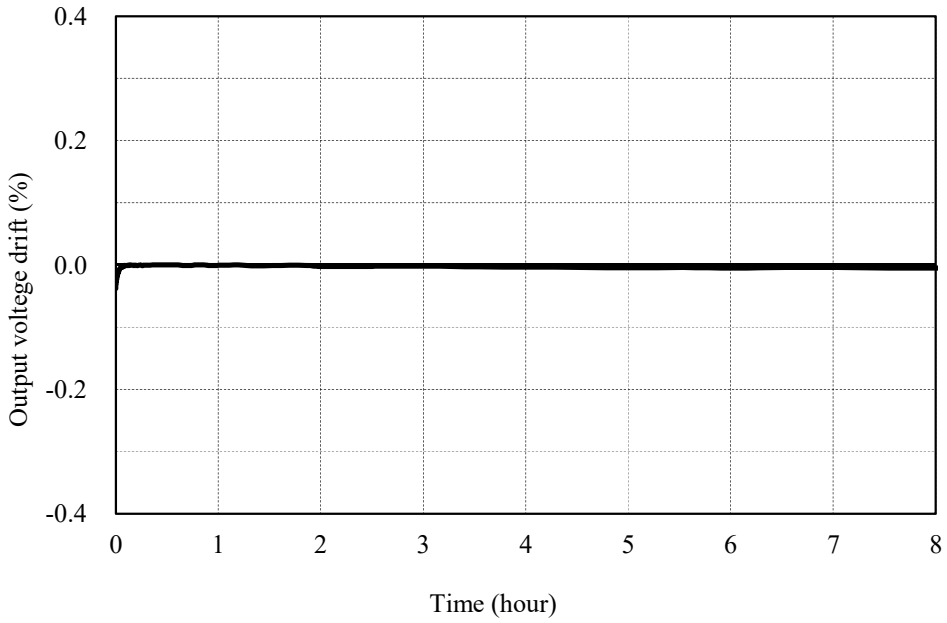
2-3. 通電ドリフト特性 Warm up voltage drift characteristics

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

±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

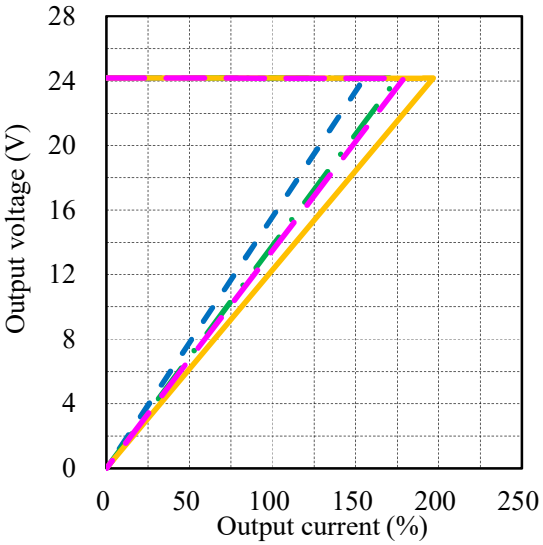
Conditions Vin : 18 VDC
: 24 VDC
: 48 VDC
: 76 VDC
Ta : 25 ℃

周囲温度依存性

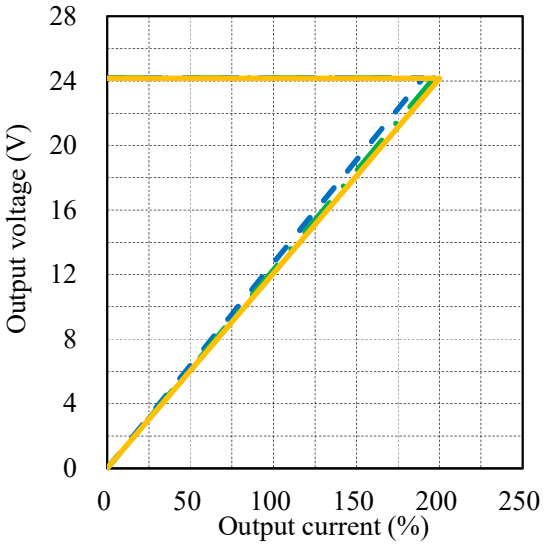
Ambient temperature dependence

Conditions Vin : 48 VDC
Ta : -40 ℃
: 25 ℃
: 85 ℃

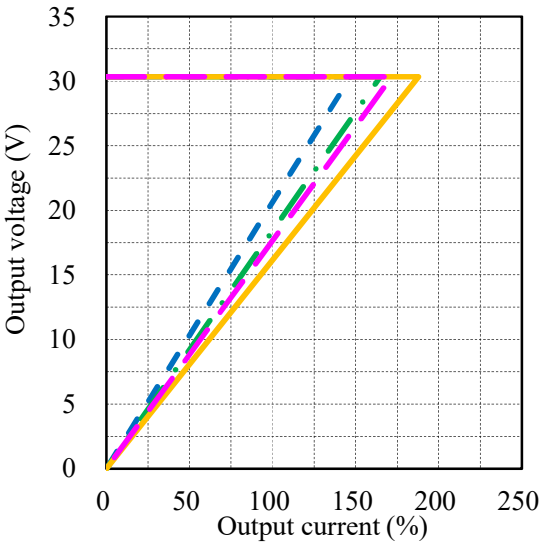
±12V



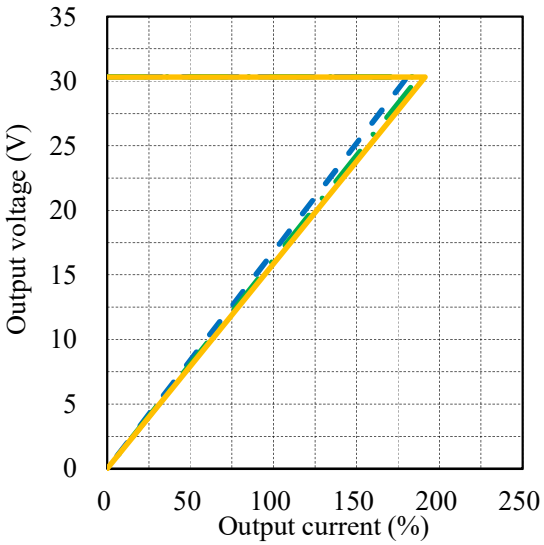
±12V



±15V



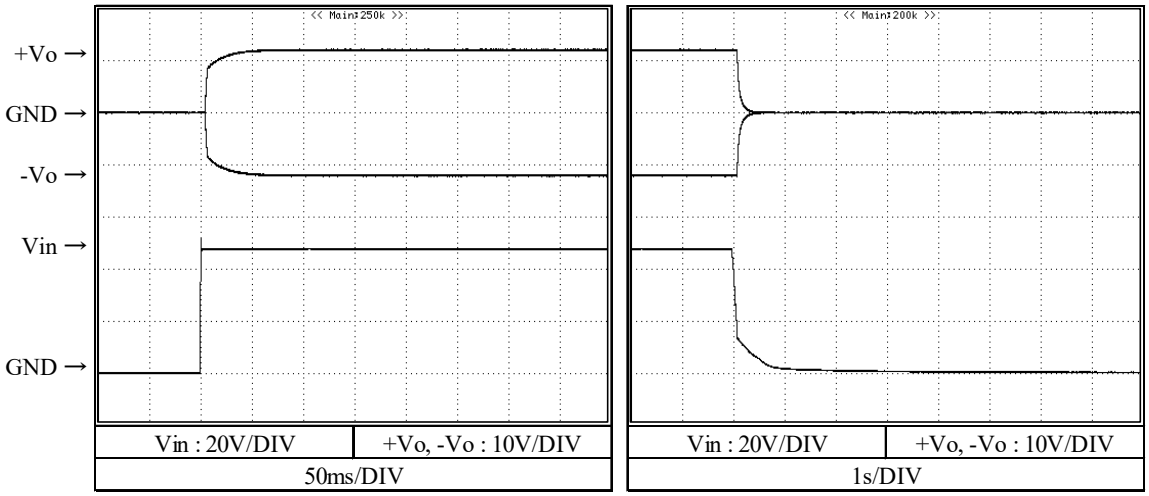
±15V



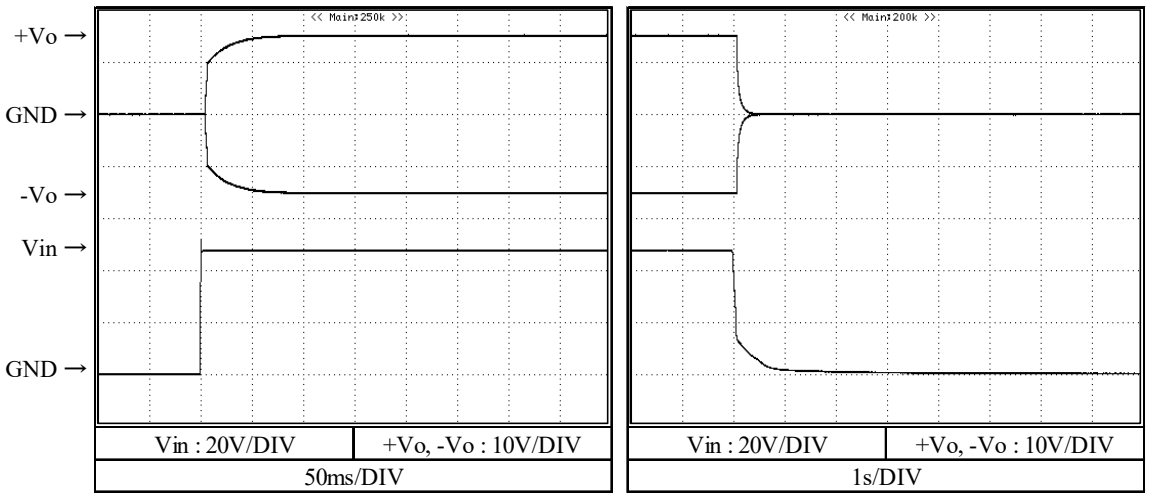
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 48 VDC
Io : 0 %
Ta : 25 ºC

±12V



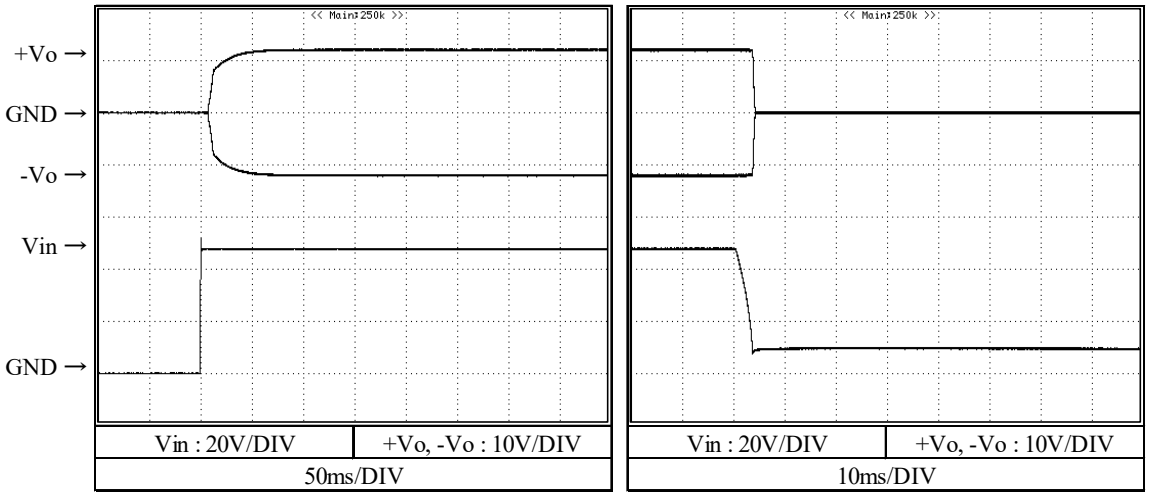
±15V



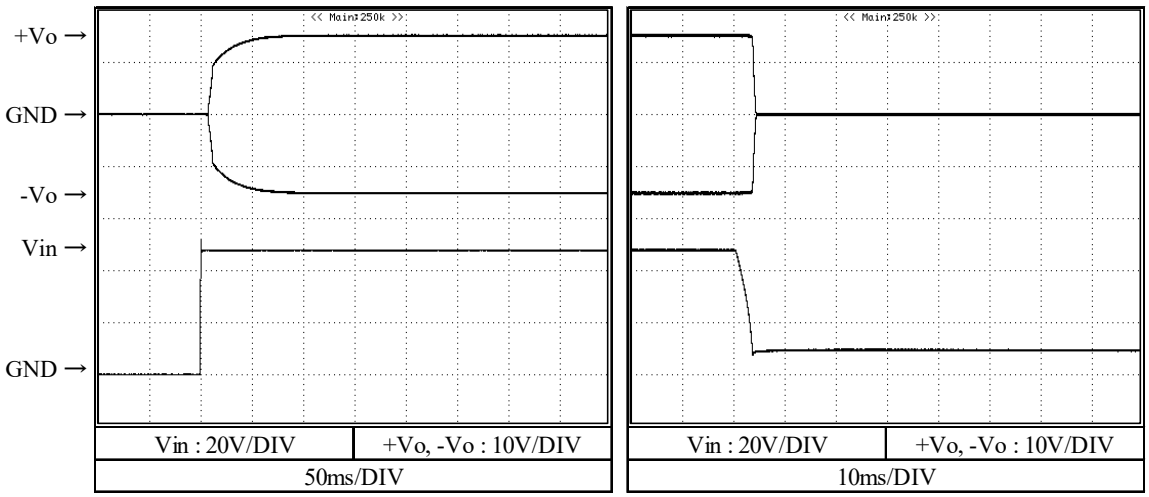
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

±12V



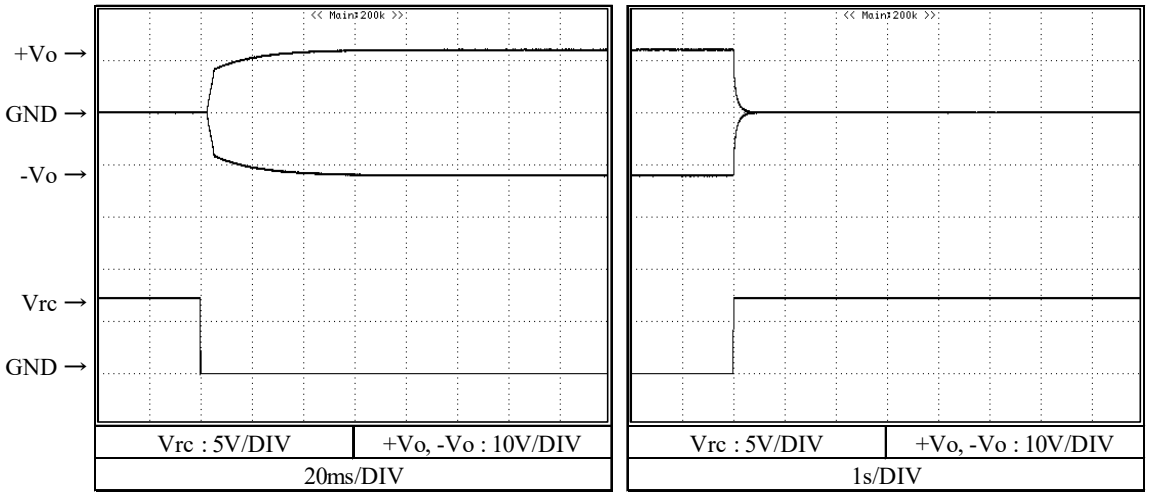
±15V



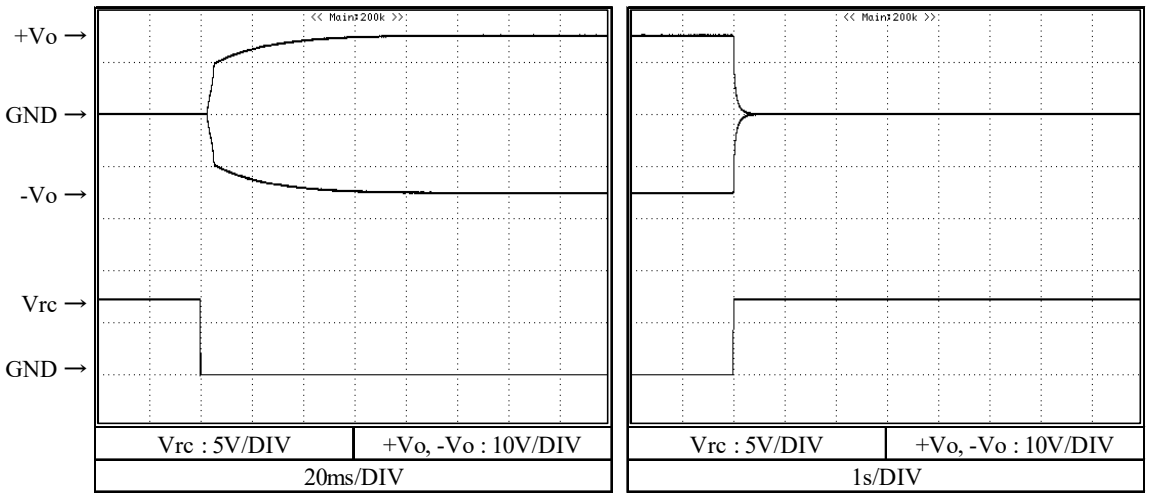
2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 48 VDC
Io : 0 %
Ta : 25 ºC

±12V



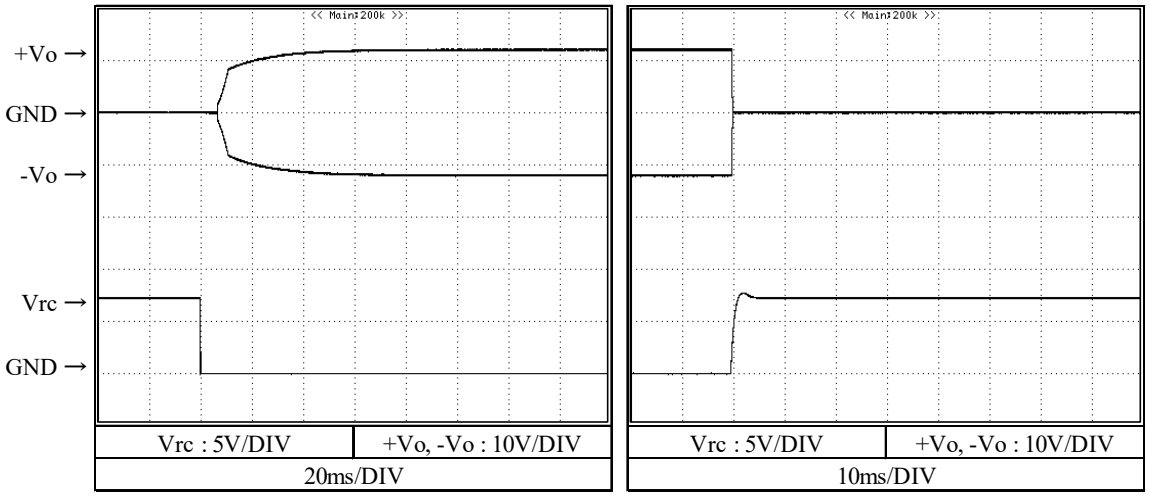
±15V



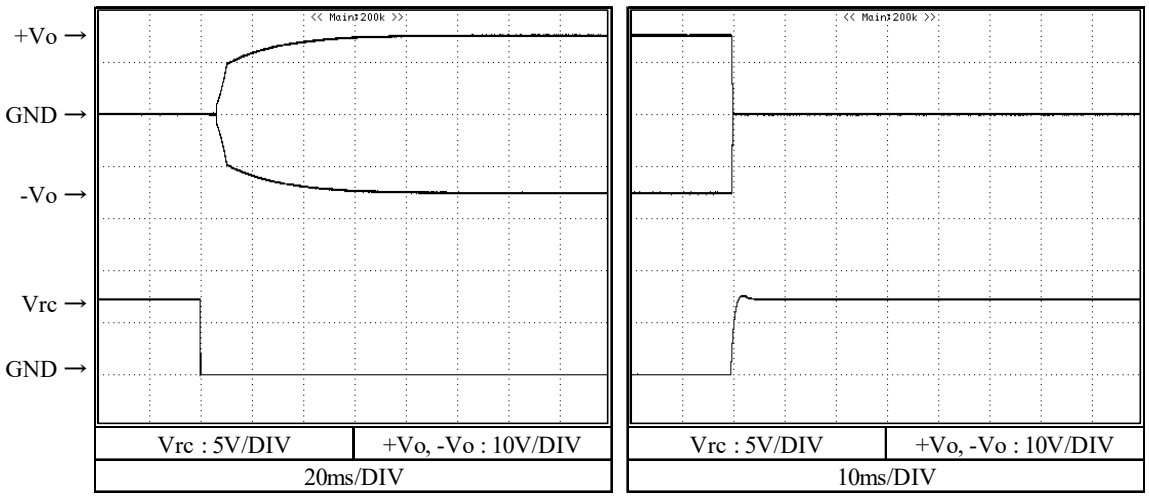
2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

±12V



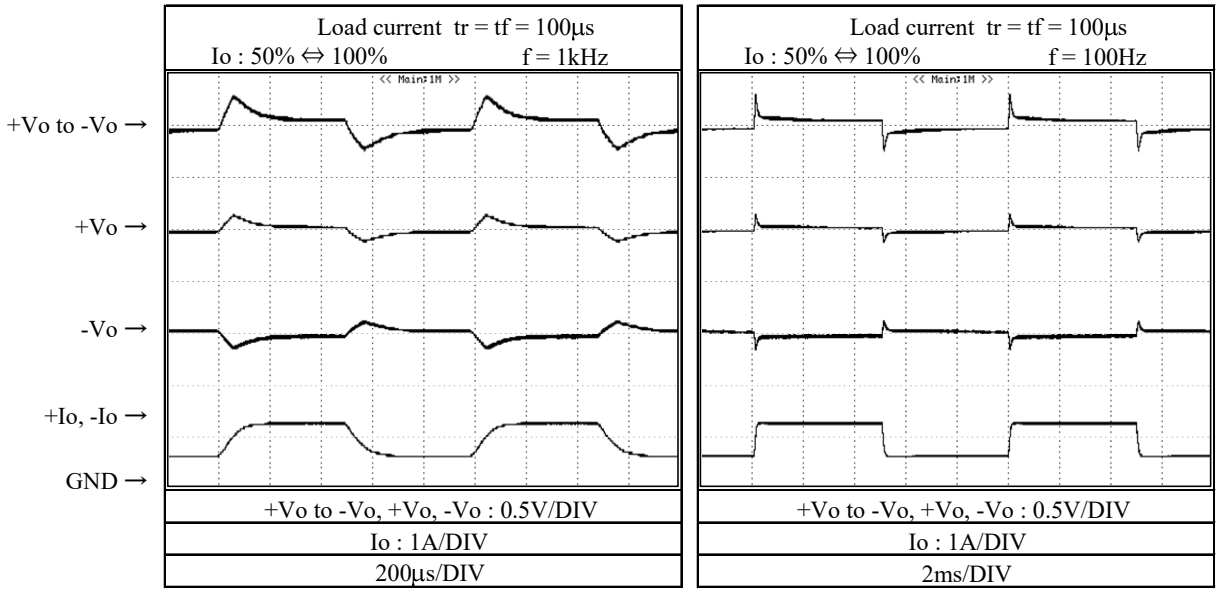
±15V



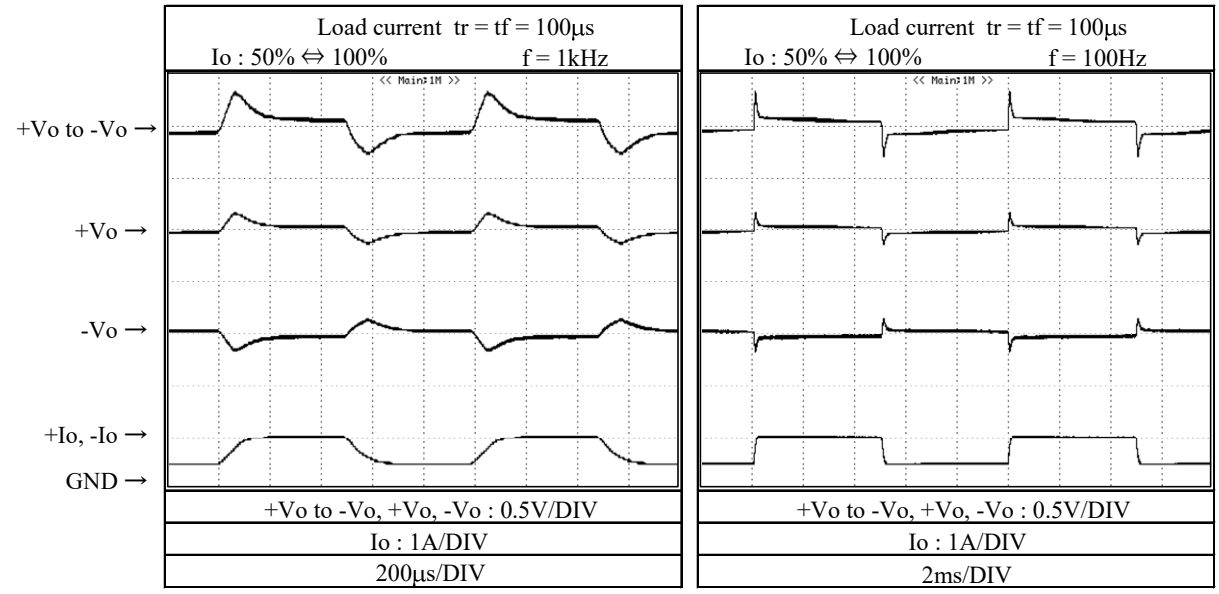
2-6. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions Vin : 48 VDC
Ta : 25 ºC

±12V



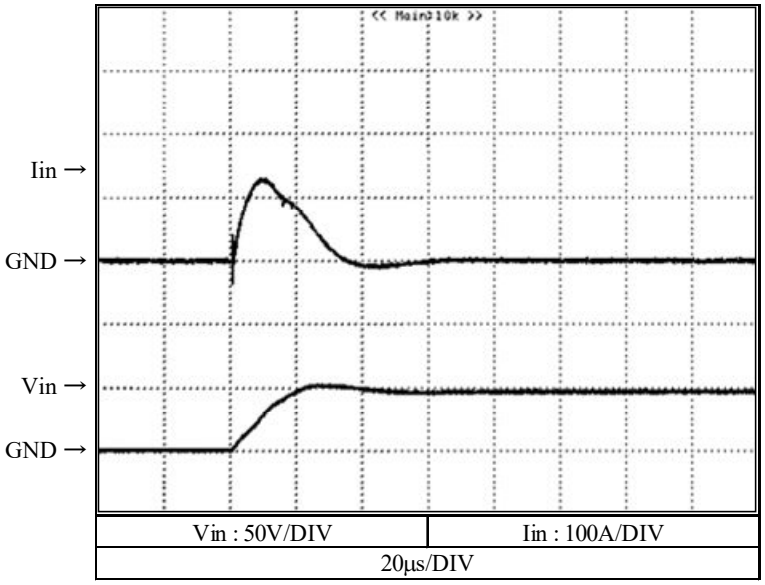
±15V



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

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

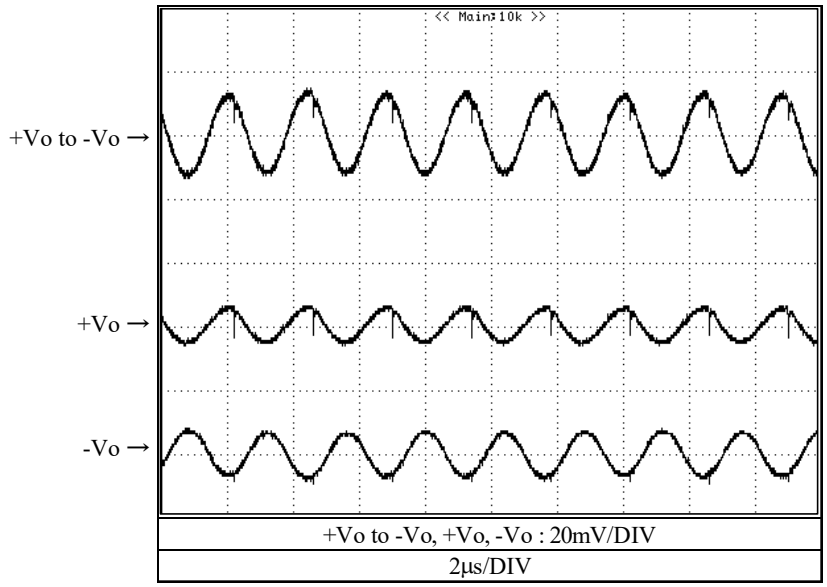
±12V



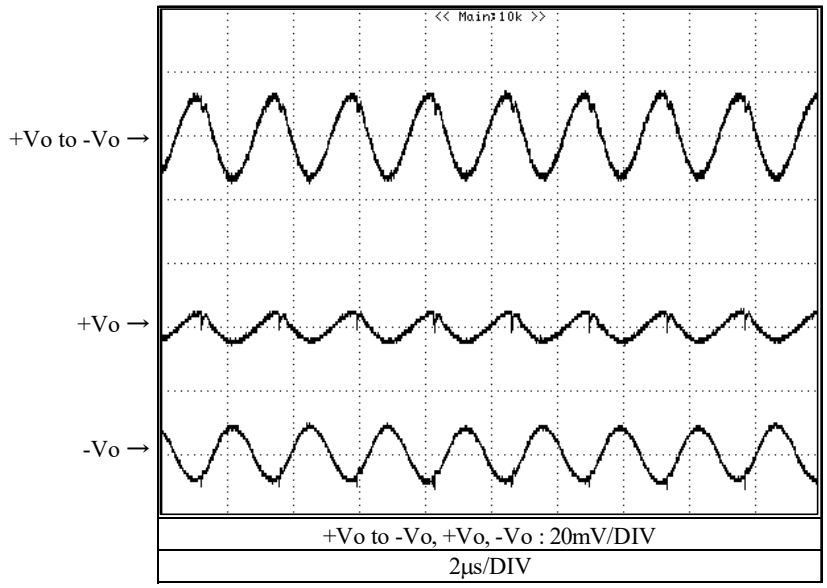
2-8. 出力リップル、ノイズ波形 Output ripple and noise waveform

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

±12V



±15V

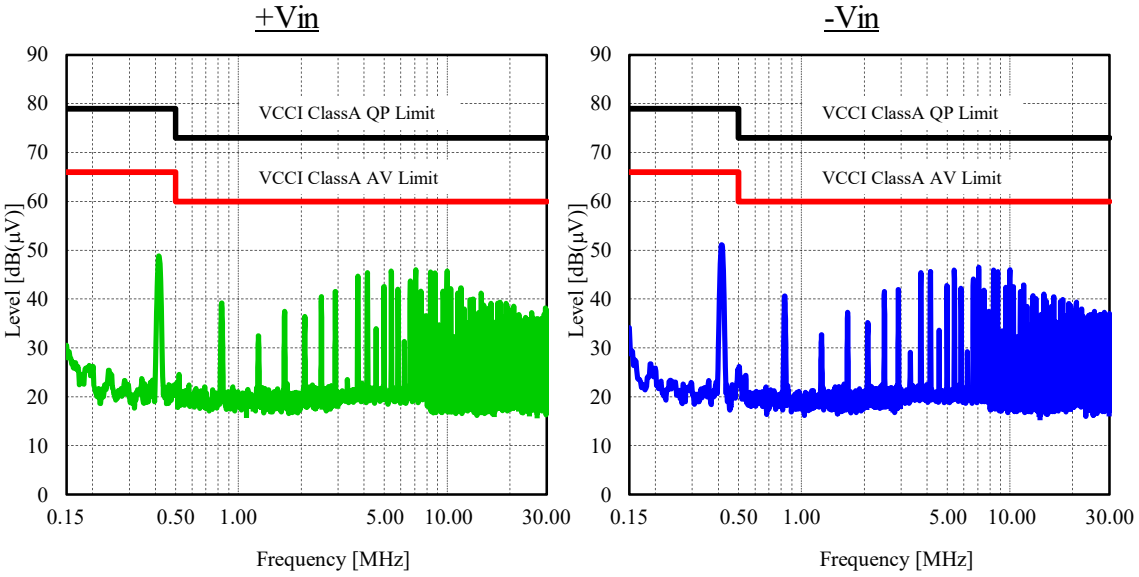


2-9. EMI特性 Electro-Magnetic Interference characteristics

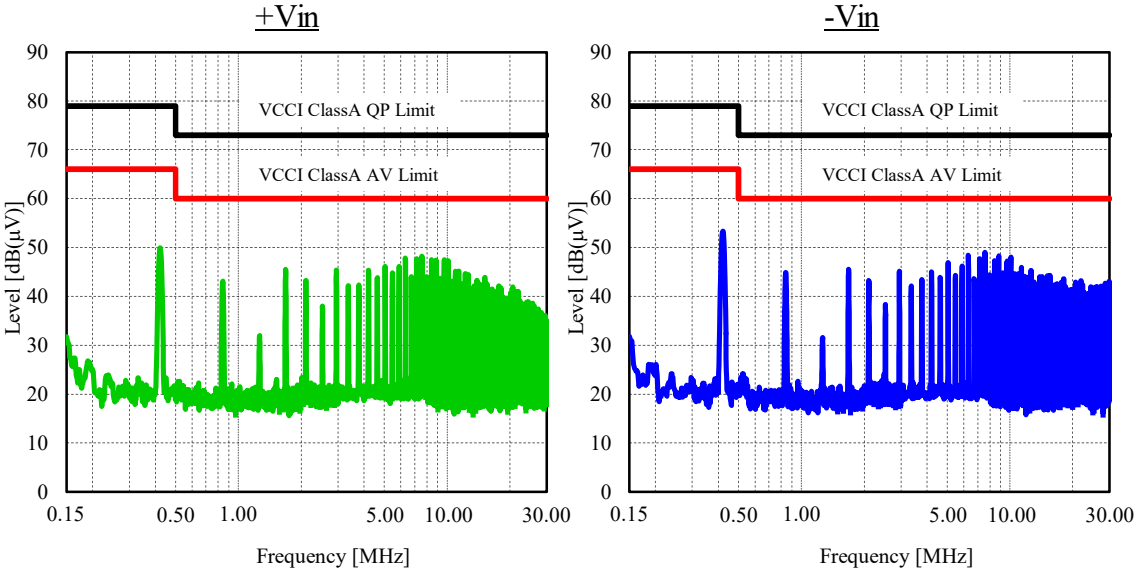
(a) 雑音端子電圧 (帰還ノイズ) Conducted Emission Noise

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

±12V



±15V



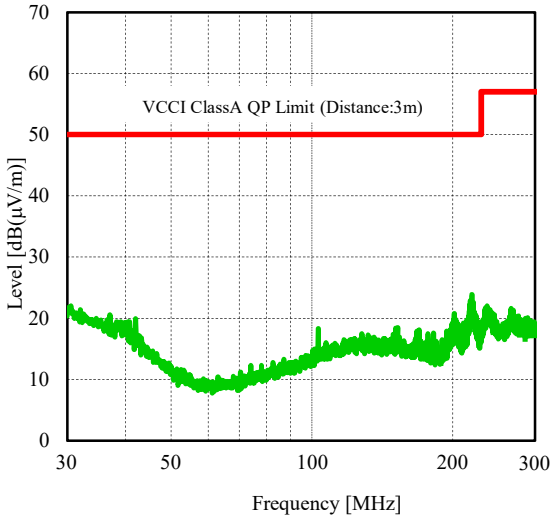
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

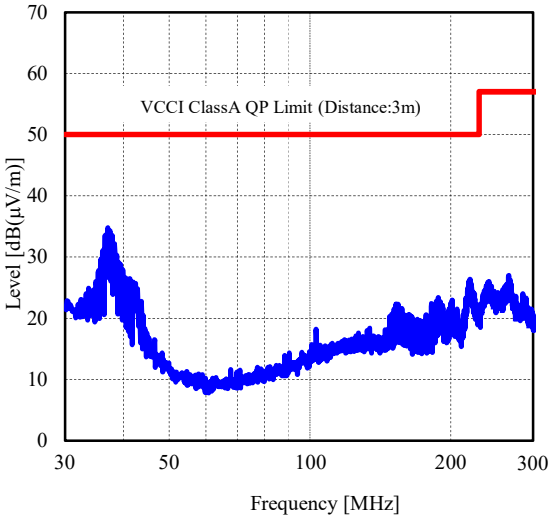
Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ºC

±12V

HORIZONTAL

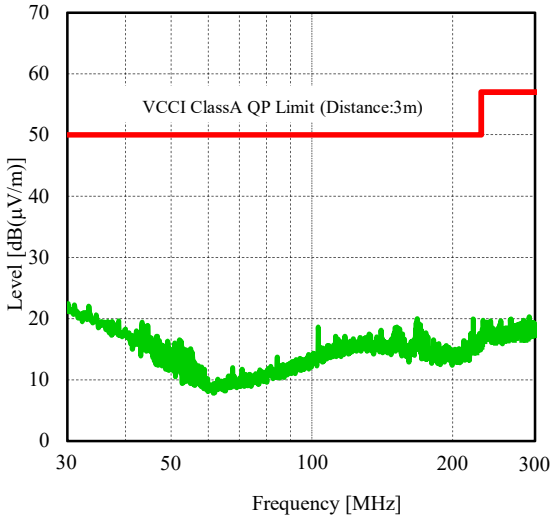


VERTICAL



±15V

HORIZONTAL



VERTICAL