CCG6-48-xxD

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
V_{RC}	·····	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

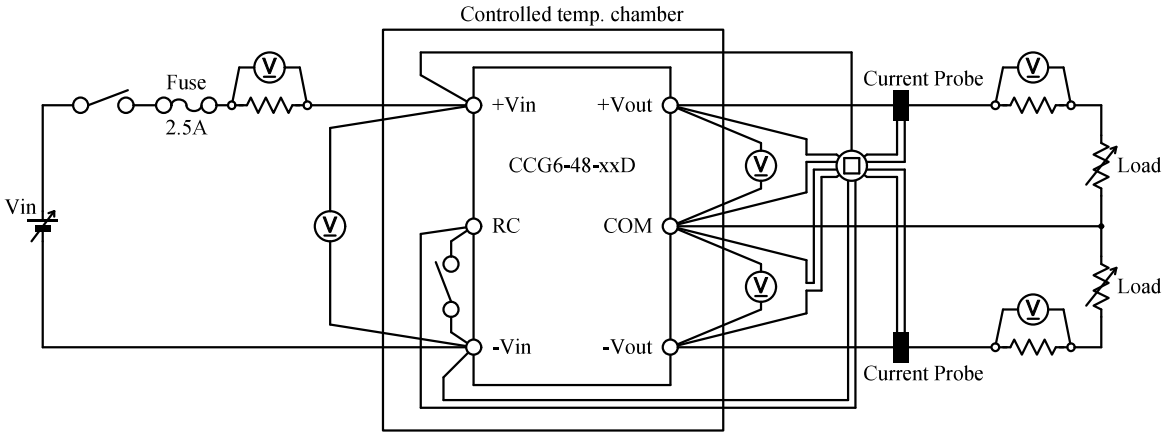
※ 当社測定条件における結果であり、参考値としてお考え願います。
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

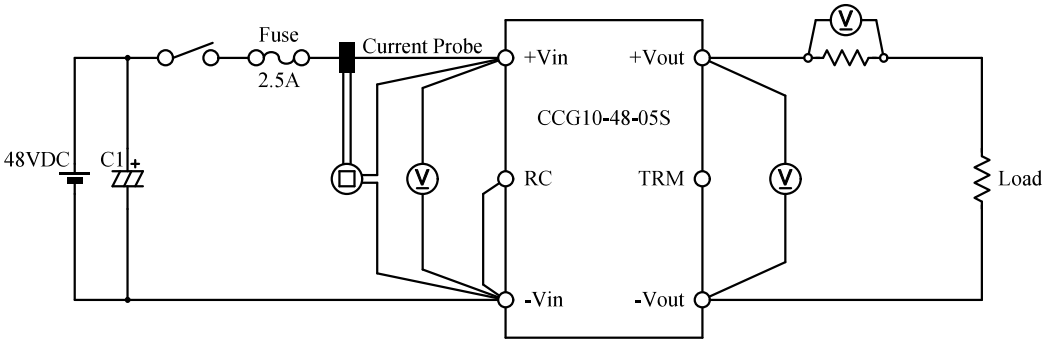
1-1. 測定回路 Measurement Circuits

(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



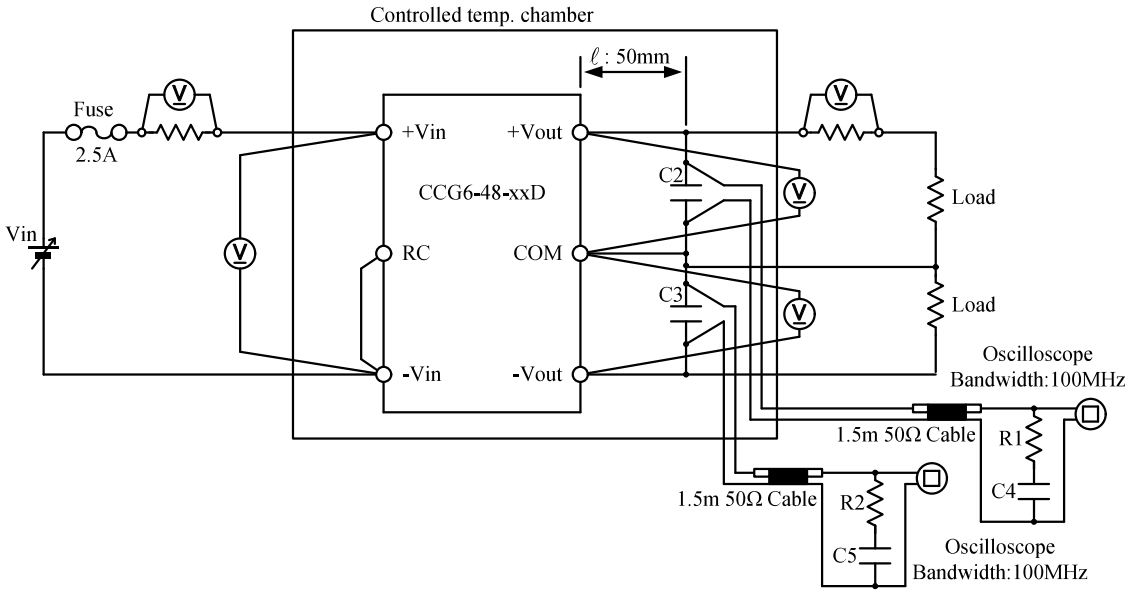
(2) 入力サージ電流（突入電流）波形 Inrush current waveform



CCG6-48-xxDの入力サージ電流特性はCCG10-48-05Sと同等です。

CCG6-48-xxD have the same Inrush current characteristics as CCG10-48-05S data.

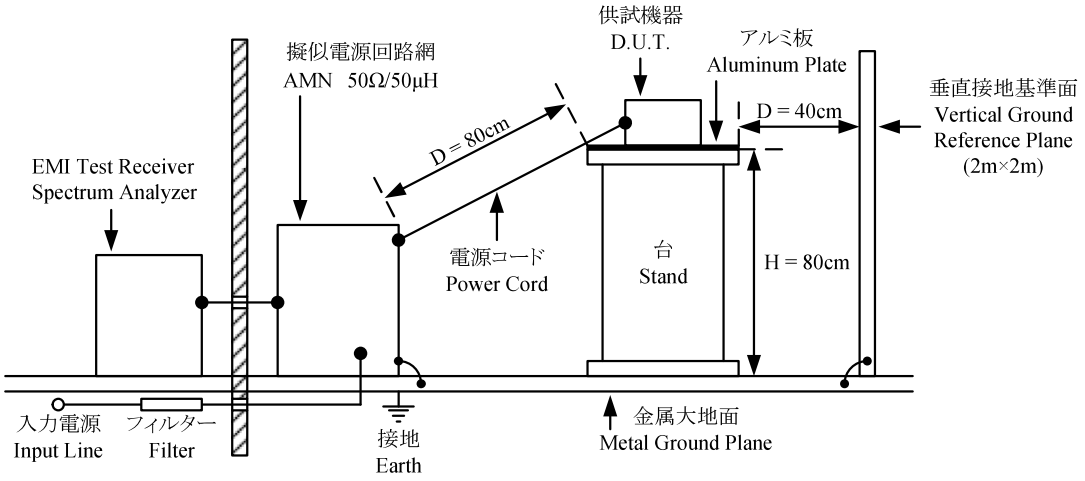
(3) 出力リップルノイズ電圧、波形 Output ripple and noise voltage and waveform



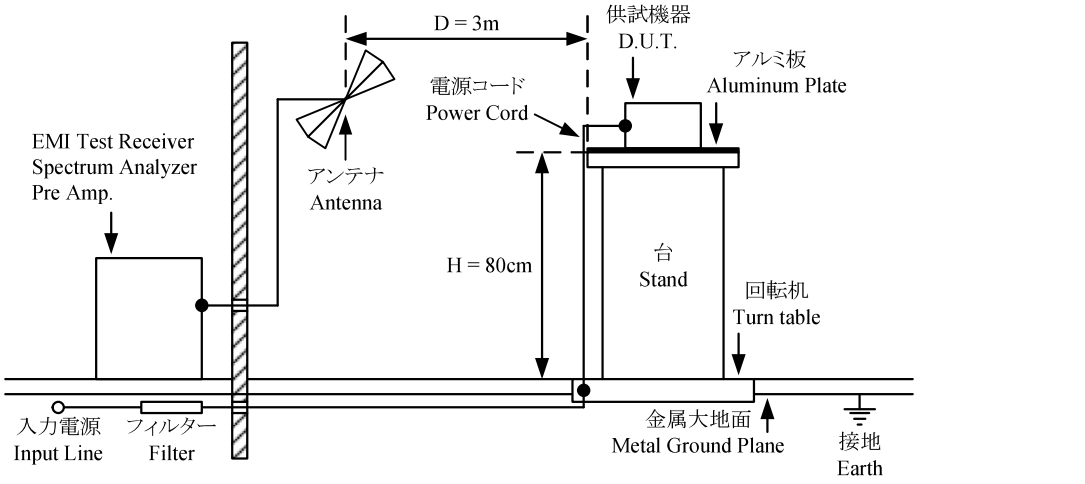
C1	: 4000uF	Electrolytic Capacitor
C2,C3	: 1uF	Ceramic Capacitor
C4,C5	: 4700pF	Ceramic Capacitor
R1,R2	: 50Ω	

(4) EMI特性　Electro-Magnetic Interference characteristics

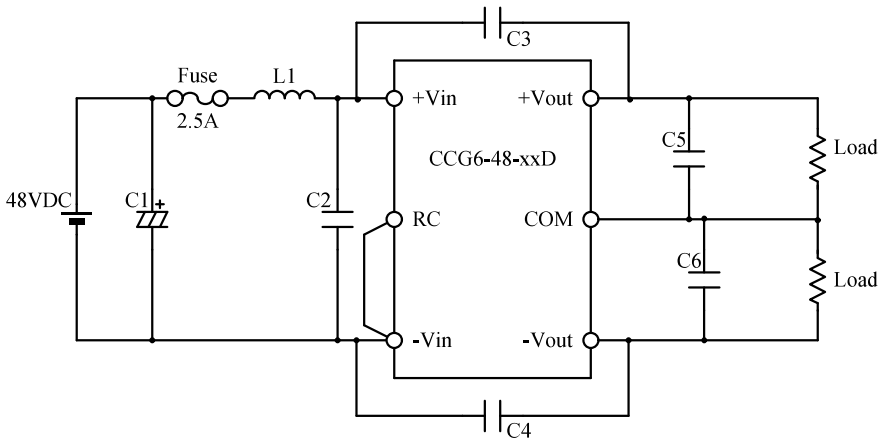
(a) 雑音端子電圧(帰還ノイズ) Conducted Emission Noise



(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	: 100V 39uF	Electrolytic Capacitor	(ELXV101ELL390MH20D,Nippon Chemi-con)
C2	: 100V 2.2uF	Ceramic Capacitor	(C3216X7S2A225KT,TDK)
C3	: 2kV 1000pF	Ceramic Capacitor	(C3225X7S3D102K200AA,TDK)
C4	: 2kV 1000pF	Ceramic Capacitor	(C3225X7S3D102K200AA,TDK)
C5	: 25V 10uF	Ceramic Capacitor	(C3216X7R1E106KT,TDK)
C6	: 25V 10uF	Ceramic Capacitor	(C3216X7R1E106KT,TDK)
L1	: 1.4A 22uH	Normal Mode Choke Coil	(LQH5BPN220MT0L,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

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

・+Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	12.0628V	12.0612V	12.0601V	12.0530V	9.8mV	0.082%
50%(0.125A)	12.0789V	12.0767V	12.0747V	12.0740V	4.9mV	0.041%
100%(0.25A)	12.0877V	12.0815V	12.0751V	12.0740V	13.7mV	0.114%
Load regulation	24.9mV	20.3mV	15.0mV	21.0mV		
	0.208%	0.169%	0.125%	0.175%		

・−Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	-12.0604V	-12.0619V	-12.0636V	-12.0698V	9.4mV	0.078%
50%(0.125A)	-12.0426V	-12.0456V	-12.0480V	-12.0488V	6.2mV	0.052%
100%(0.25A)	-12.0345V	-12.0413V	-12.0476V	-12.0492V	14.7mV	0.123%
Load regulation	25.9mV	20.6mV	16.0mV	21.0mV		
	0.216%	0.172%	0.133%	0.175%		

・+Vo to −Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	24.1232V	24.1231V	24.1237V	24.1228V	0.9mV	0.004%
50%(0.125A)	24.1215V	24.1223V	24.1227V	24.1227V	1.2mV	0.005%
100%(0.25A)	24.1222V	24.1228V	24.1227V	24.1231V	0.9mV	0.004%
Load regulation	1.7mV	0.8mV	1.0mV	0.4mV		
	0.007%	0.003%	0.004%	0.002%		

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

Ta	-40°C	25°C	80°C	Temperature stability	
+Vo	12.0217V	12.0751V	12.0596V	53.4mV	0.445%
-Vo	-11.9958V	-12.0476V	-12.0319V	51.8mV	0.432%
+Vo to -Vo	24.0175V	24.1227V	24.0915V	105.2mV	0.438%

3. Load Regulation - Unbalance load　　Condition　Ta :　25 °C

・+Vo (-Io : 100%)

+Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.05A)	12.2018V	12.1868V	12.1868V	12.1792V
100%(0.25A)	12.0890V	12.0824V	12.0824V	12.0743V
Load regulation	112.8mV	104.4mV	104.4mV	104.9mV
	0.940%	0.870%	0.870%	0.874%

・−Vo (+Io : 100%)

-Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.05A)	-12.1521V	-12.1432V	-12.1432V	-12.1432V
100%(0.25A)	-12.0342V	-12.0412V	-12.0412V	-12.0489V
Load regulation	117.9mV	102.0mV	102.0mV	94.3mV
	0.983%	0.850%	0.850%	0.786%

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

・+Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	15.0184V	14.9955V	15.0368V	15.0248V	41.3mV	0.275%
50%(0.1A)	15.0850V	15.0696V	15.0526V	15.0806V	32.4mV	0.216%
100%(0.2A)	15.0574V	15.0698V	15.0818V	15.0840V	26.6mV	0.177%
Load regulation	66.6mV	74.3mV	45.0mV	59.2mV		
	0.444%	0.495%	0.300%	0.395%		

・−Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	-15.0706V	-15.0761V	-15.0559V	-15.0797V	23.8mV	0.159%
50%(0.1A)	-15.0302V	-15.0178V	-15.0363V	-15.0020V	34.3mV	0.229%
100%(0.2A)	-15.0050V	-15.0079V	-15.0207V	-15.0049V	15.8mV	0.105%
Load regulation	65.6mV	68.2mV	35.2mV	77.7mV		
	0.437%	0.455%	0.235%	0.518%		

・+Vo to −Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	30.0891V	30.0716V	30.0928V	30.1046V	33.0mV	0.110%
50%(0.1A)	30.1153V	30.0874V	30.0889V	30.0826V	32.7mV	0.109%
100%(0.2A)	30.0624V	30.0777V	30.1025V	30.0889V	40.1mV	0.134%
Load regulation	52.9mV	15.8mV	13.6mV	22.0mV		
	0.176%	0.053%	0.045%	0.073%		

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

Ta	-40°C	25°C	80°C	Temperature stability	
+Vo	15.0129V	15.0818V	15.0731V	68.9mV	0.459%
-Vo	-14.9424V	-15.0207V	-14.9968V	78.3mV	0.522%
+Vo to -Vo	29.9554V	30.1025V	30.0700V	147.1mV	0.490%

3. Load Regulation - Unbalance load Condition Ta : 25 °C

・+Vo (-Io : 100%)

+Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.04A)	15.2096V	15.1630V	15.1630V	15.1682V
100%(0.2A)	15.0575V	15.0700V	15.0700V	15.0788V
Load regulation	152.1mV	93.0mV	93.0mV	89.4mV
	1.014%	0.620%	0.620%	0.596%

・−Vo (+Io : 100%)

-Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.04A)	-15.1219V	-15.1258V	-15.1258V	-15.1084V
100%(0.2A)	-15.0031V	-15.0064V	-15.0064V	-15.0098V
Load regulation	118.8mV	119.4mV	119.4mV	98.6mV
	0.792%	0.796%	0.796%	0.657%

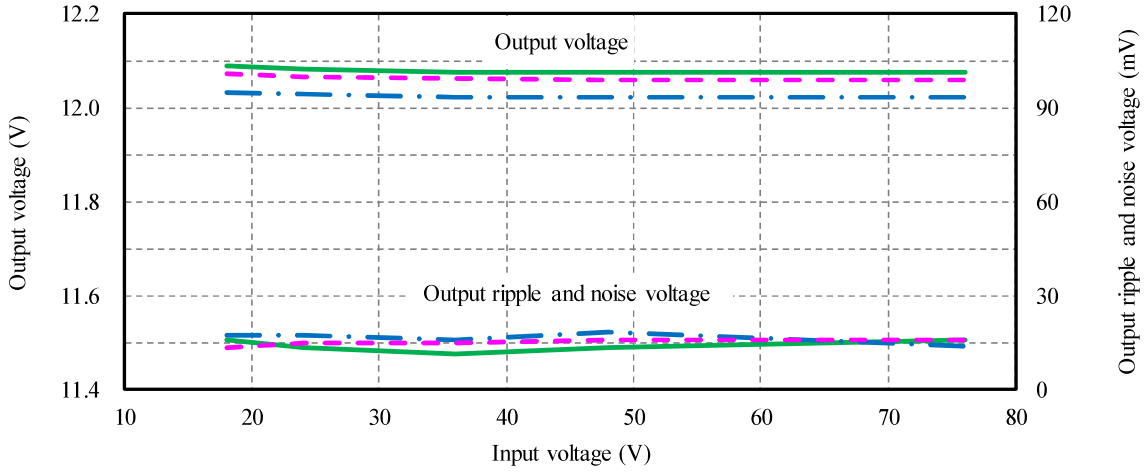
(2) 出力電圧・出力リップルノイズ電圧 対 入力電圧

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

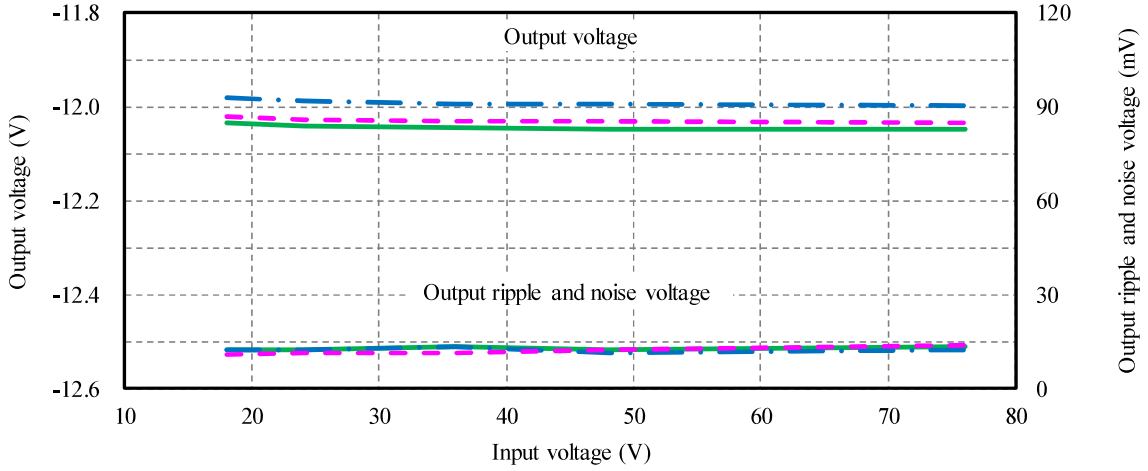
Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 80 °C

±12V

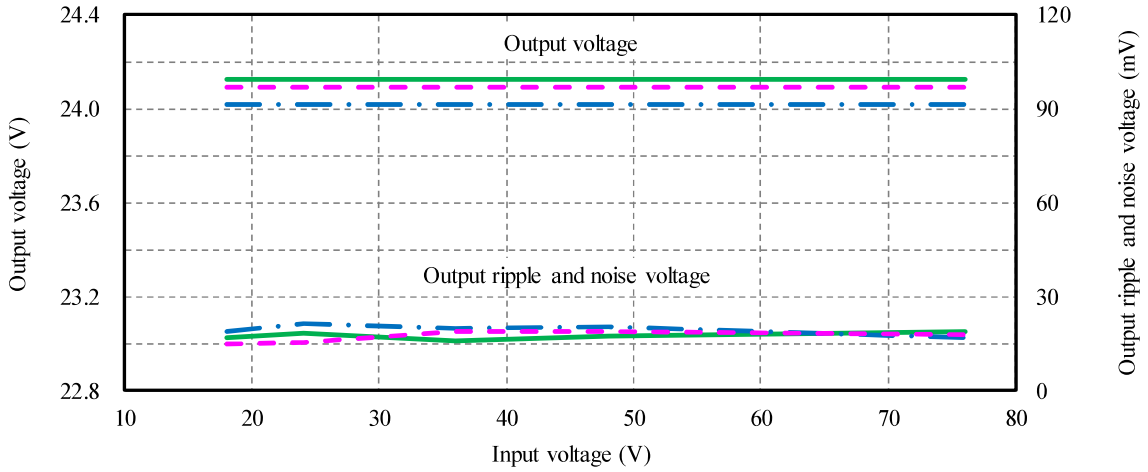
・+Vo



・−Vo



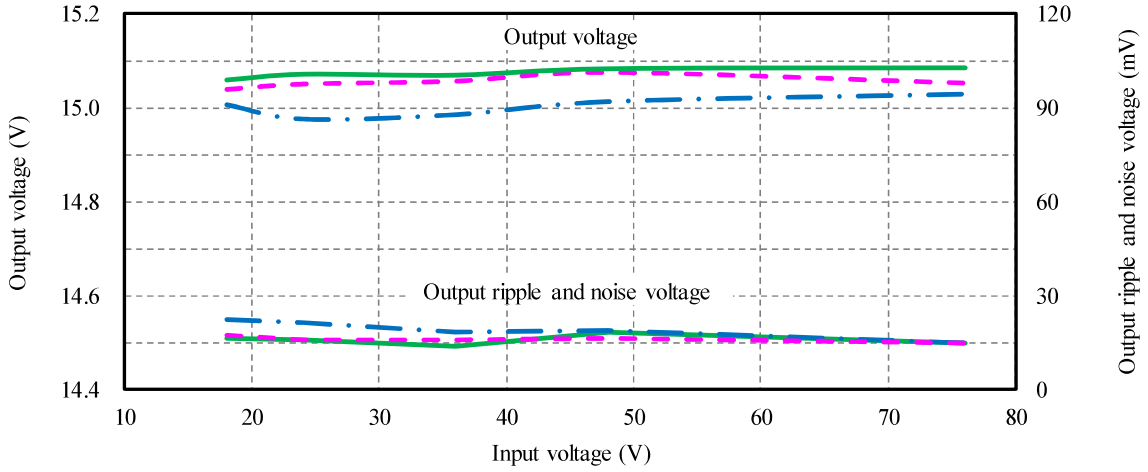
・+Vo to -Vo



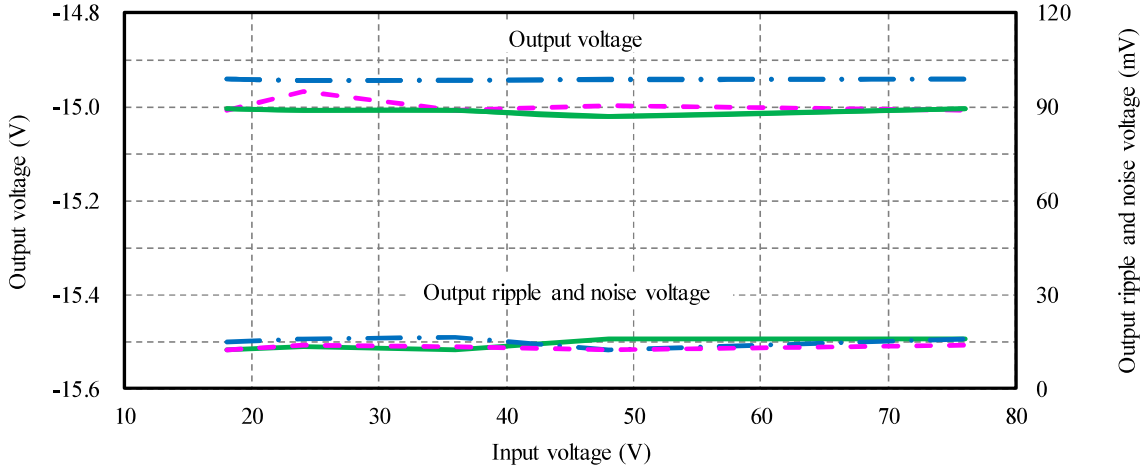
Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 80 °C

±15V

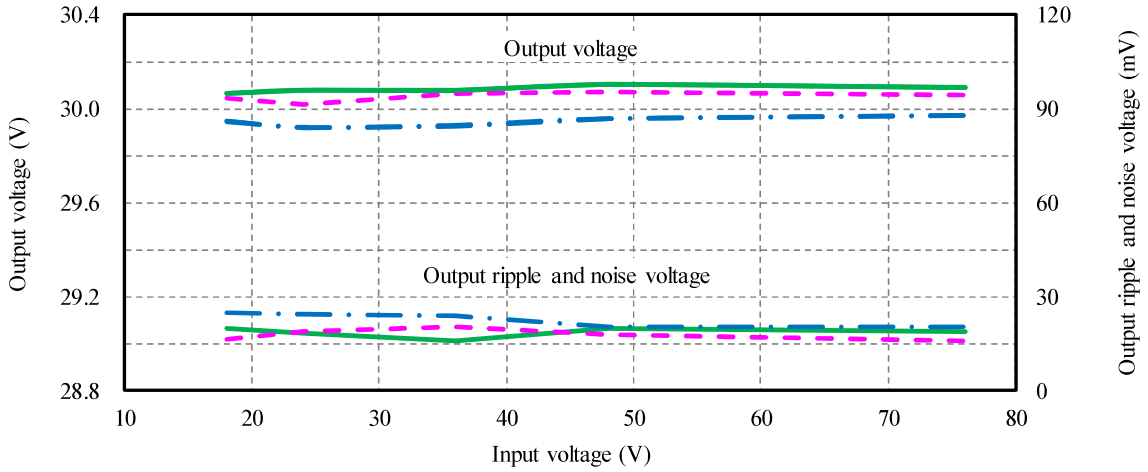
・+Vo



・−Vo



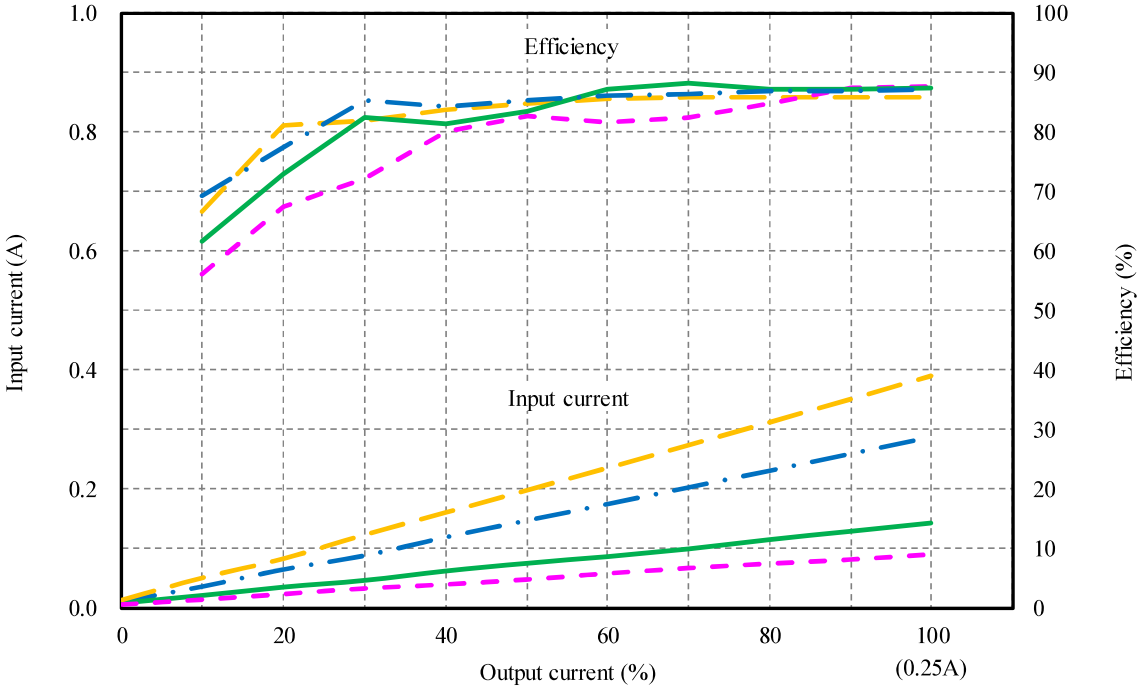
・+Vo to -Vo



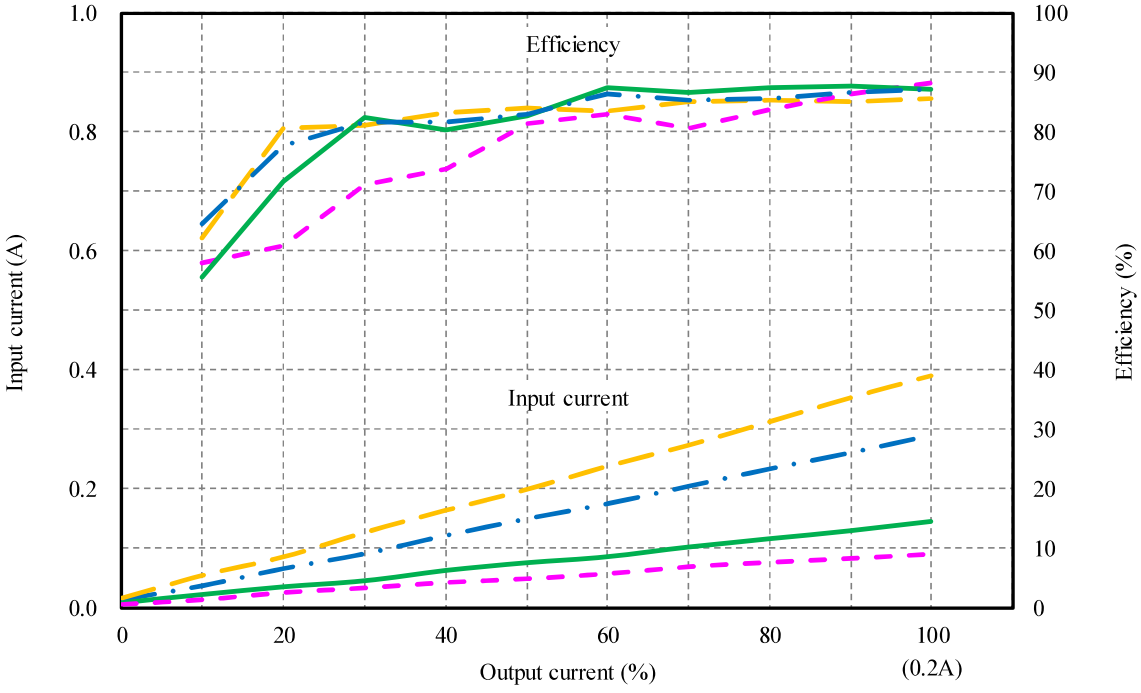
(3) 入力電流･効率 対 出力電流　Input current and Efficiency vs. Output current

Conditions　Vin　:　18 VDC
:　24 VDC
:　48 VDC
:　76 VDC
Ta　:　25 °C

±12V



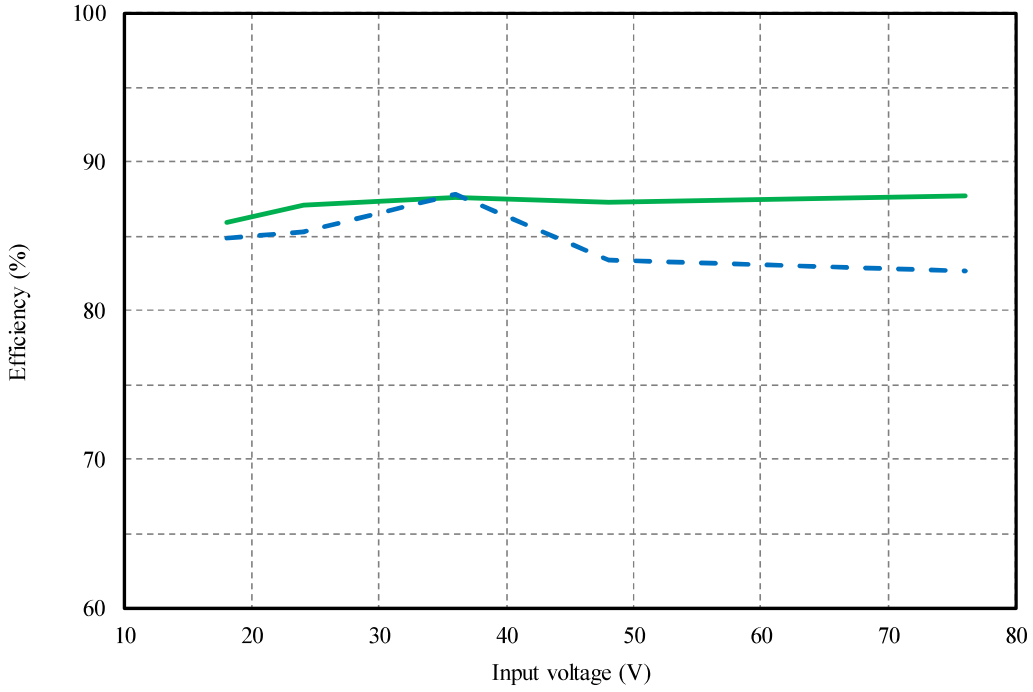
±15V



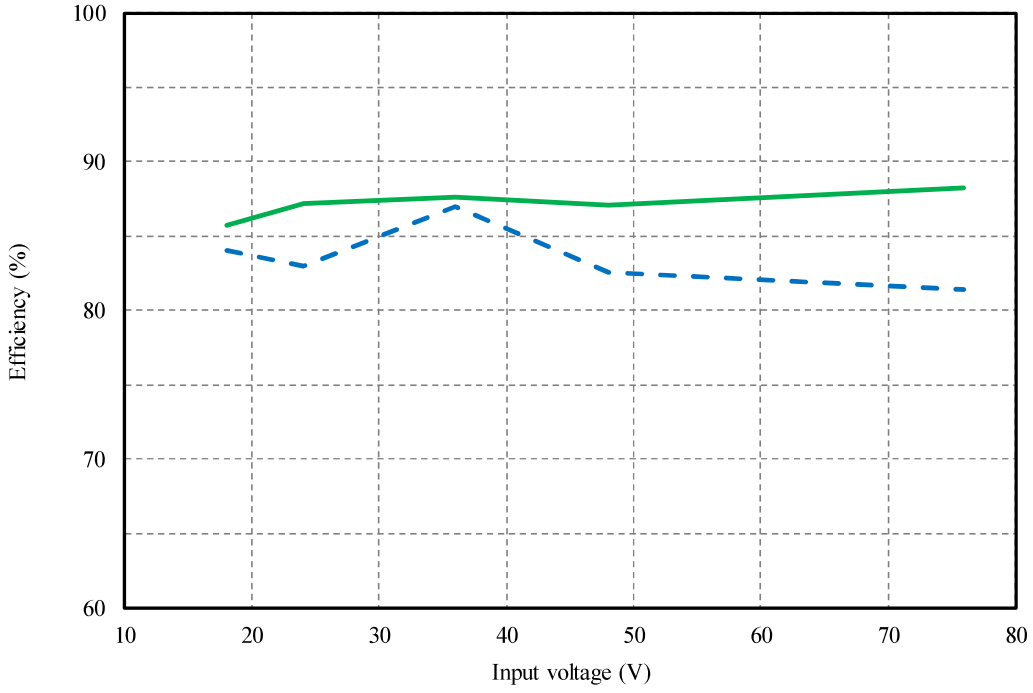
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

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

±12V



±15V

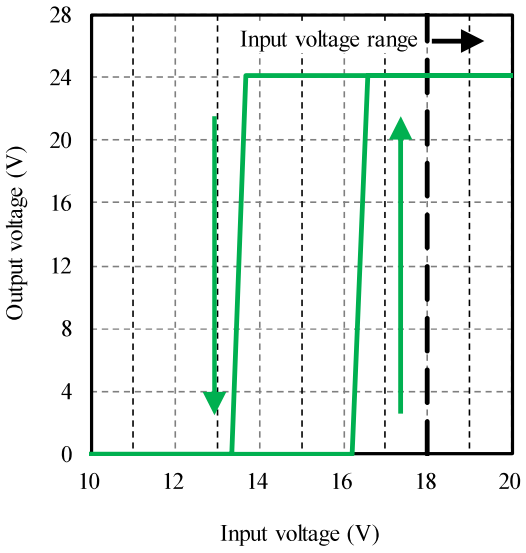


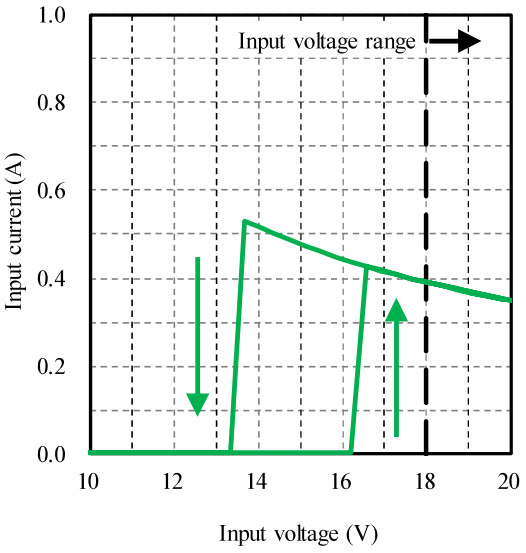
(5) 起動・遮断電圧特性 Start up and Drop out voltage characteristics

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

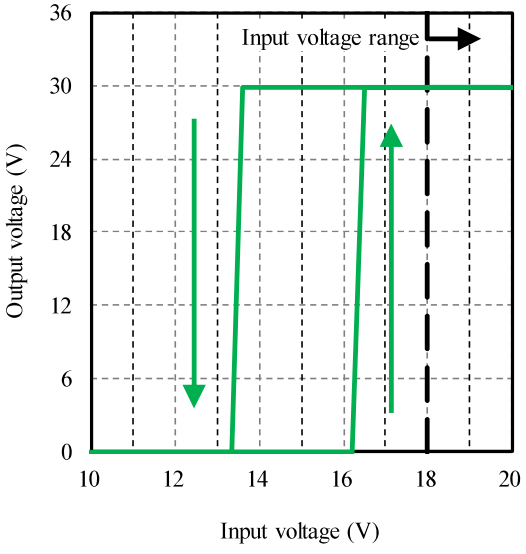
入力電流 対 入力電圧
Input current vs. Input voltage
Conditions Io : 100 %
Ta : 25 °C

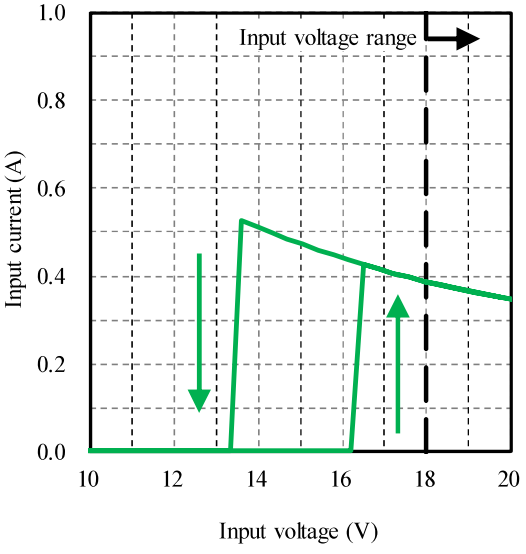
±12V





±15V

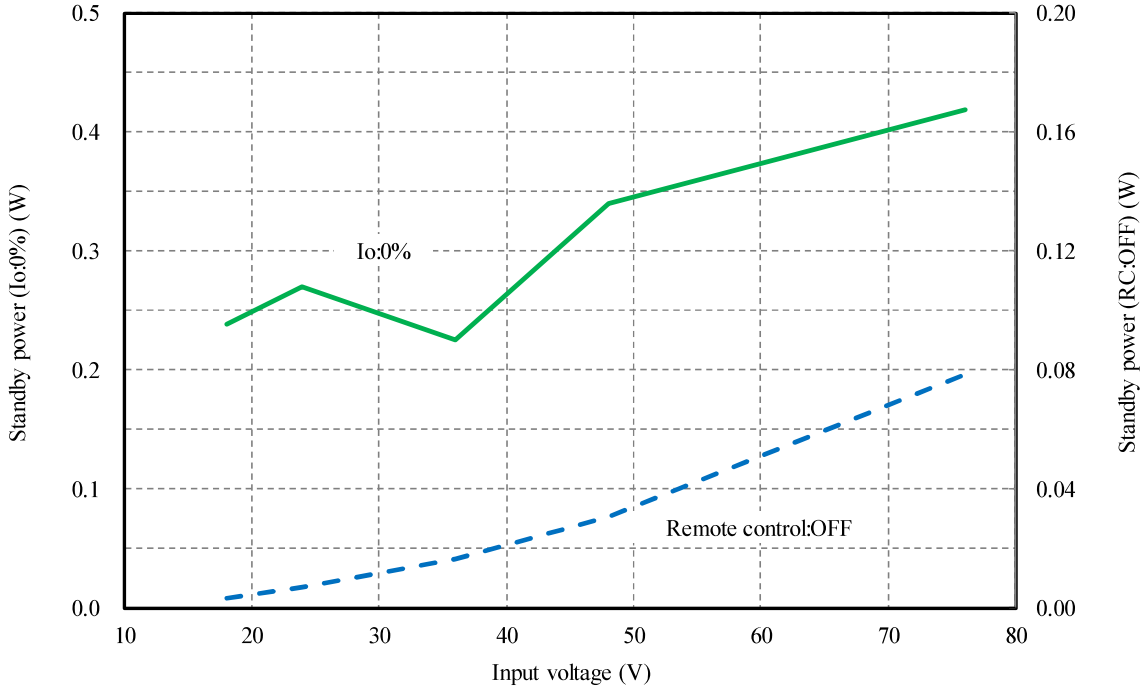




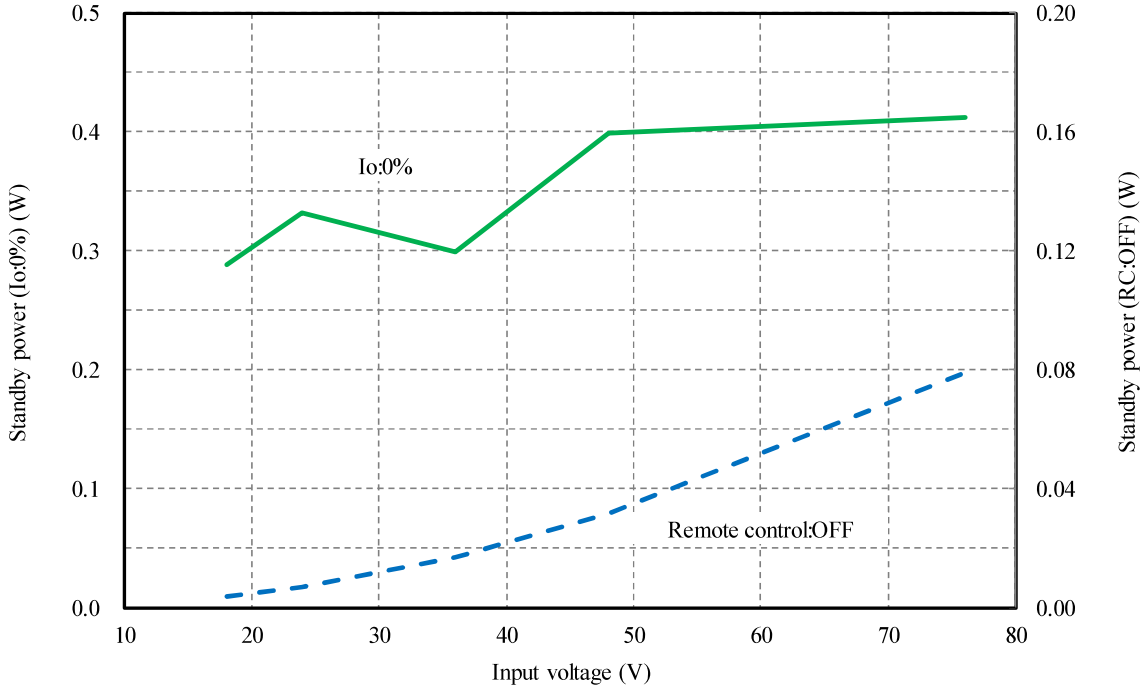
2-2. 待機電力特性 Standby power characteristics

Condition Ta : 25 °C

±12V



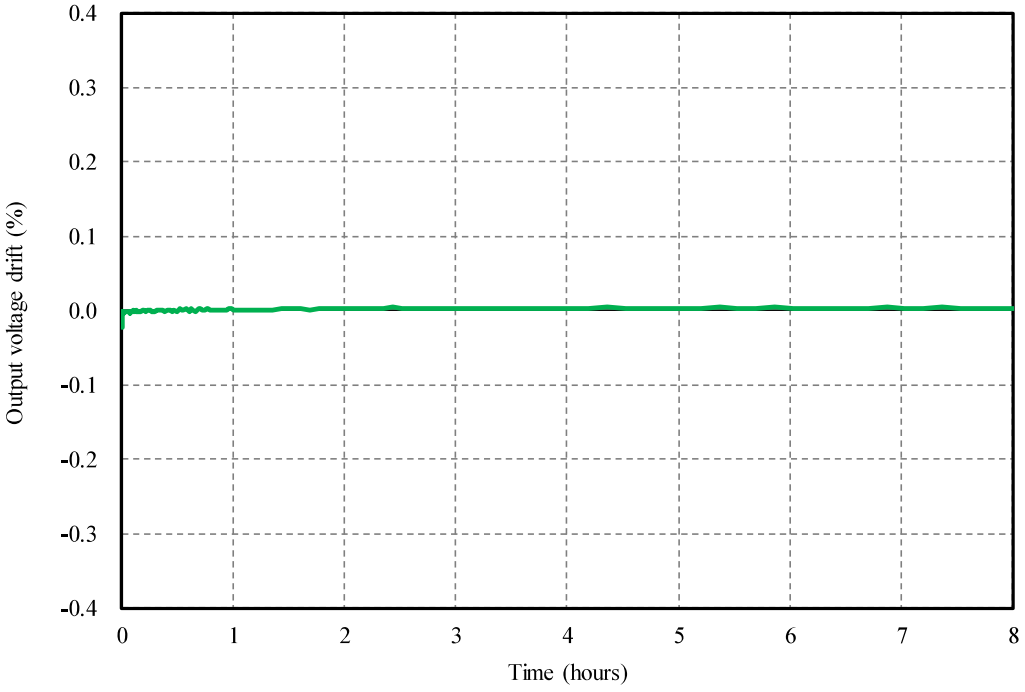
±15V



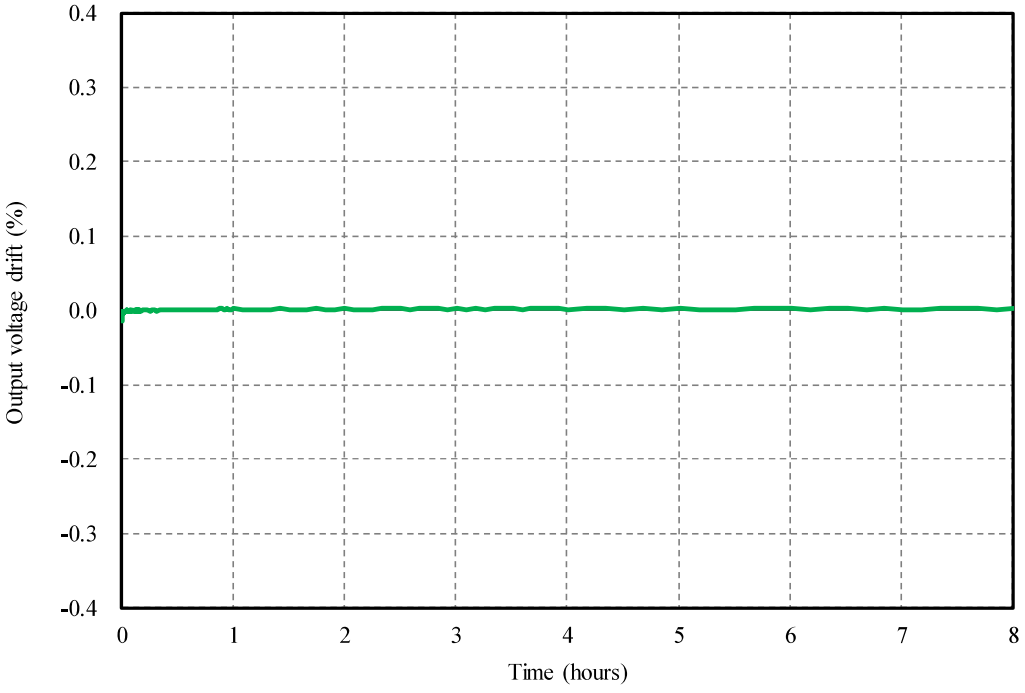
2-3. 通電ドリフト特性 Warm up voltage drift characteristics

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 °C

±12V



±15V



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

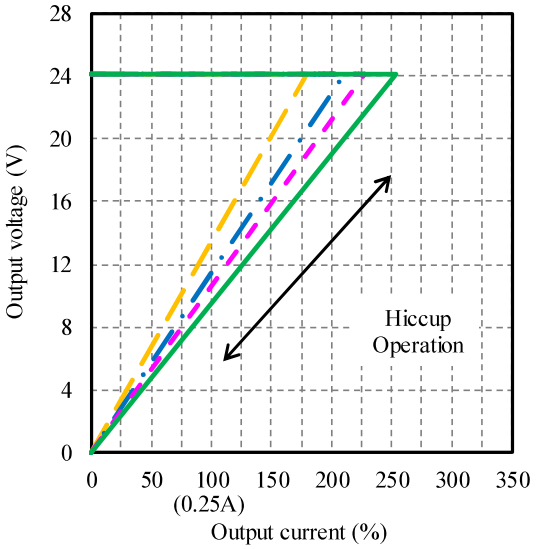
入力電圧依存性
Input voltage dependence

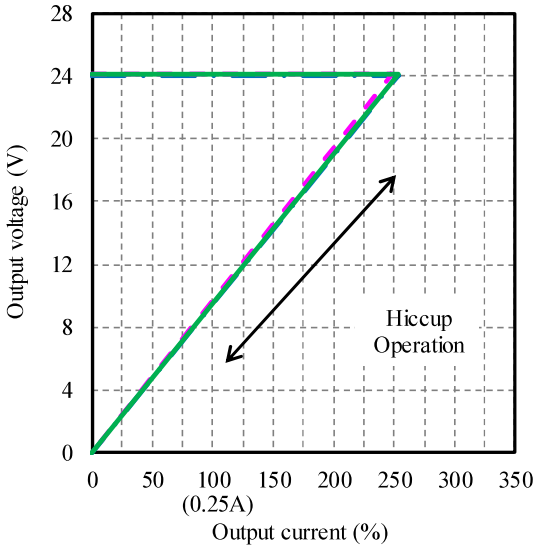
Conditions Vin : 18 VDC
: 24 VDC
: 48 VDC
: 76 VDC
Ta : 25 °C

周囲温度依存性
Ambient temperature dependence

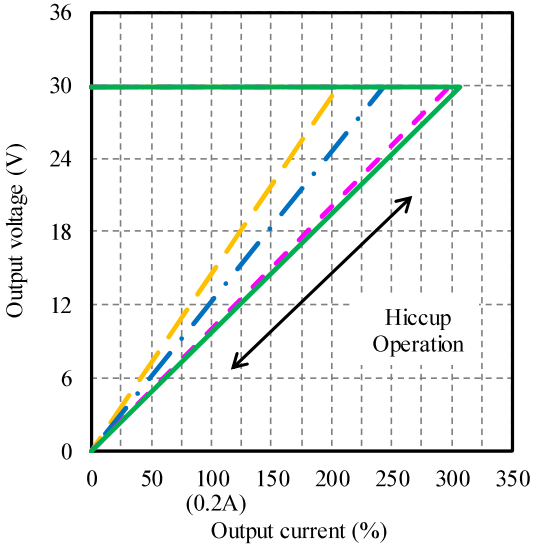
Conditions Vin : 48 VDC
Ta : -40 °C
: 25 °C
: 80 °C

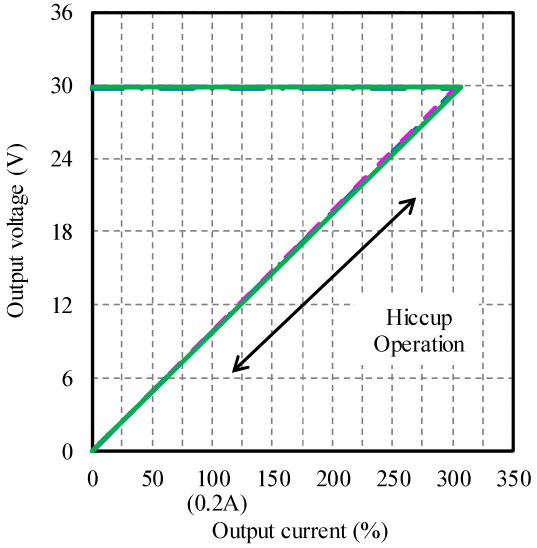
±12V





±15V

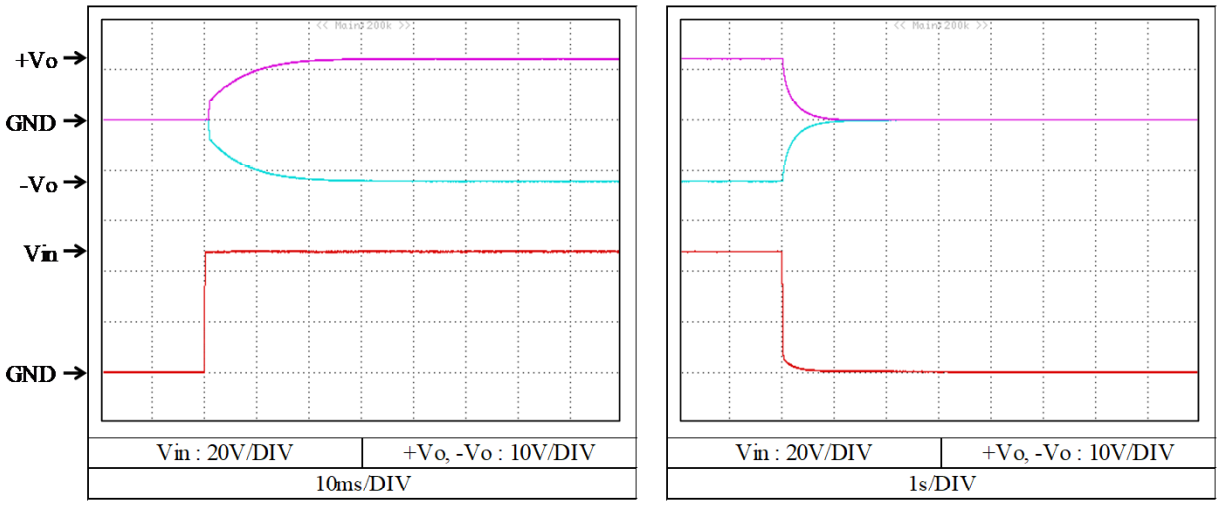




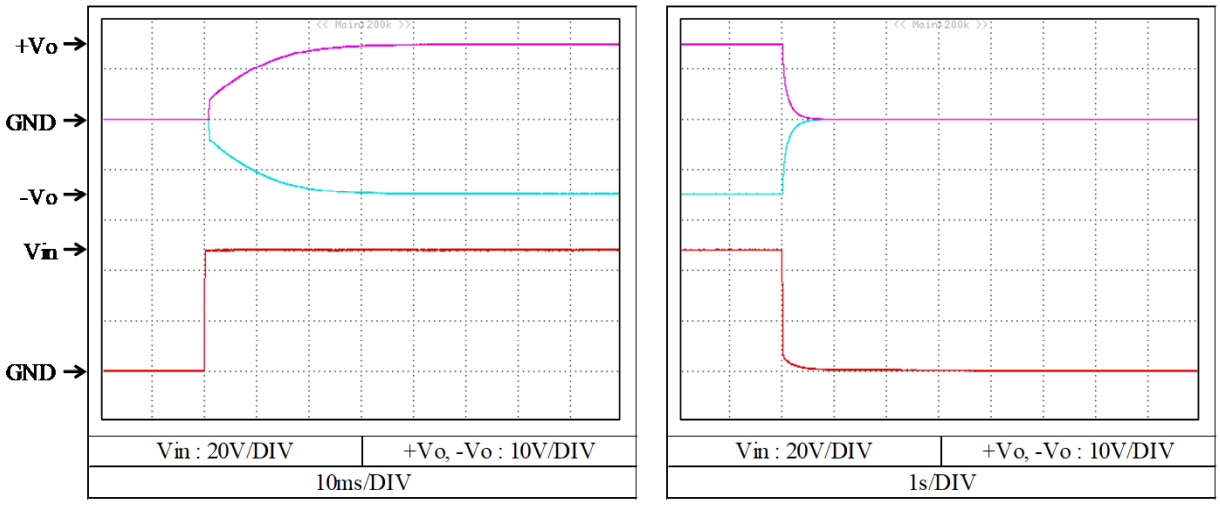
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 48 VDC
Io : 0 %
Ta : 25 °C

±12V



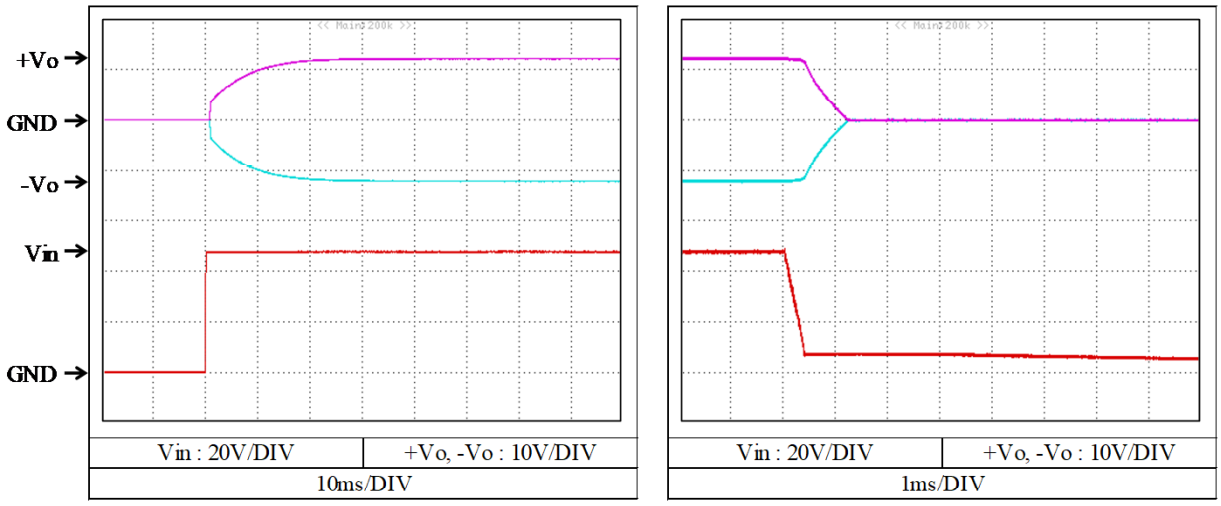
+15V



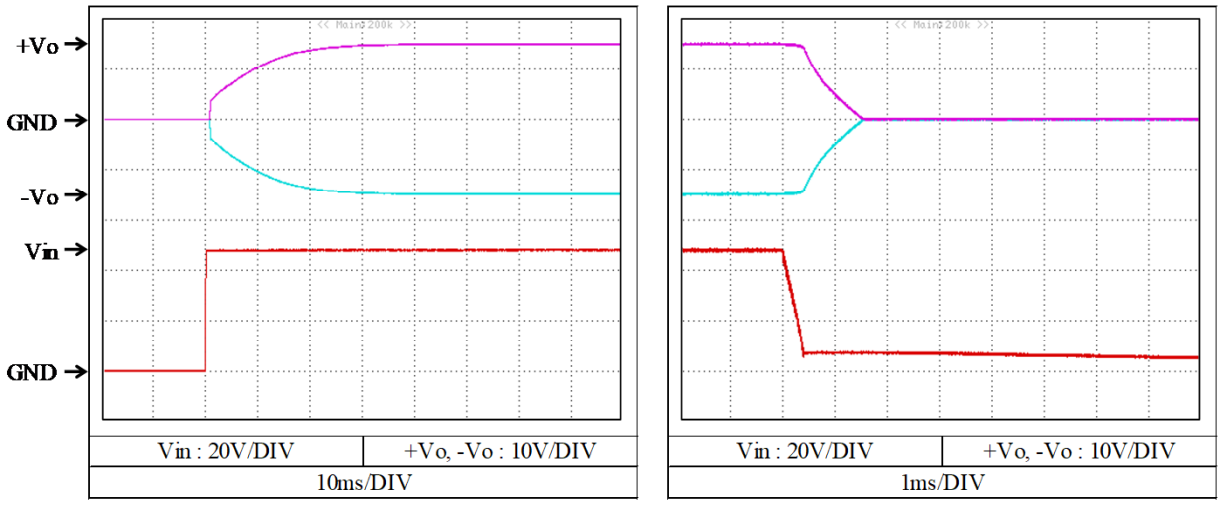
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 °C

±12V



+15V

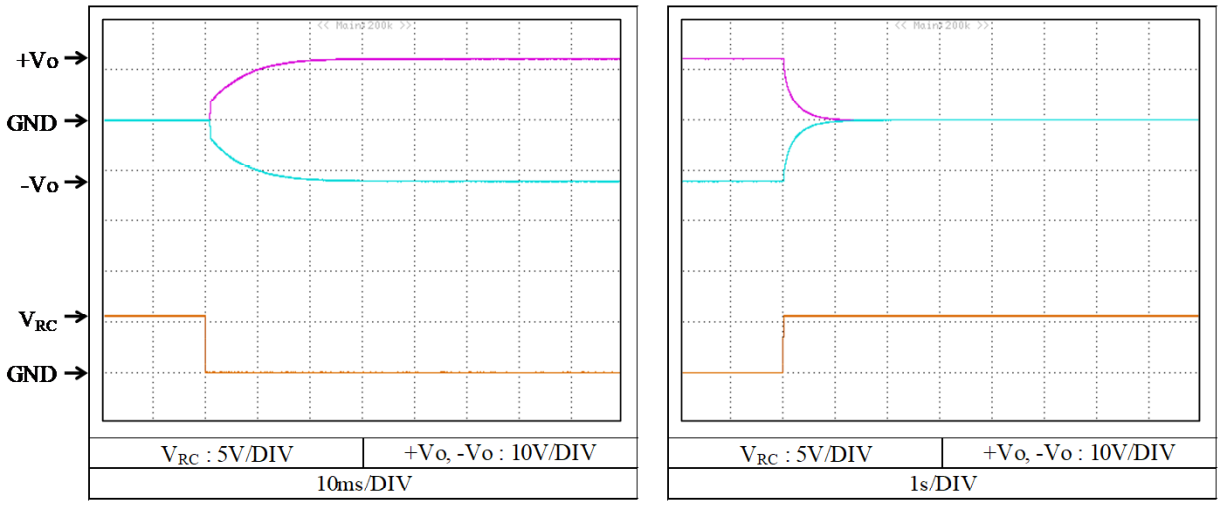


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

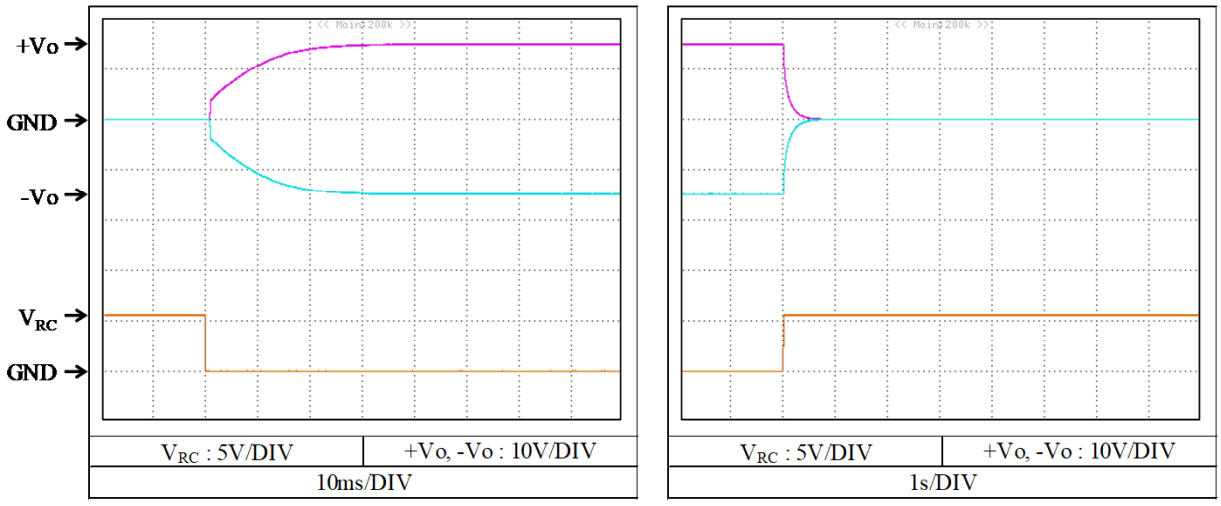
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 48 VDC
Io : 0 %
Ta : 25 °C

±12V



+15V

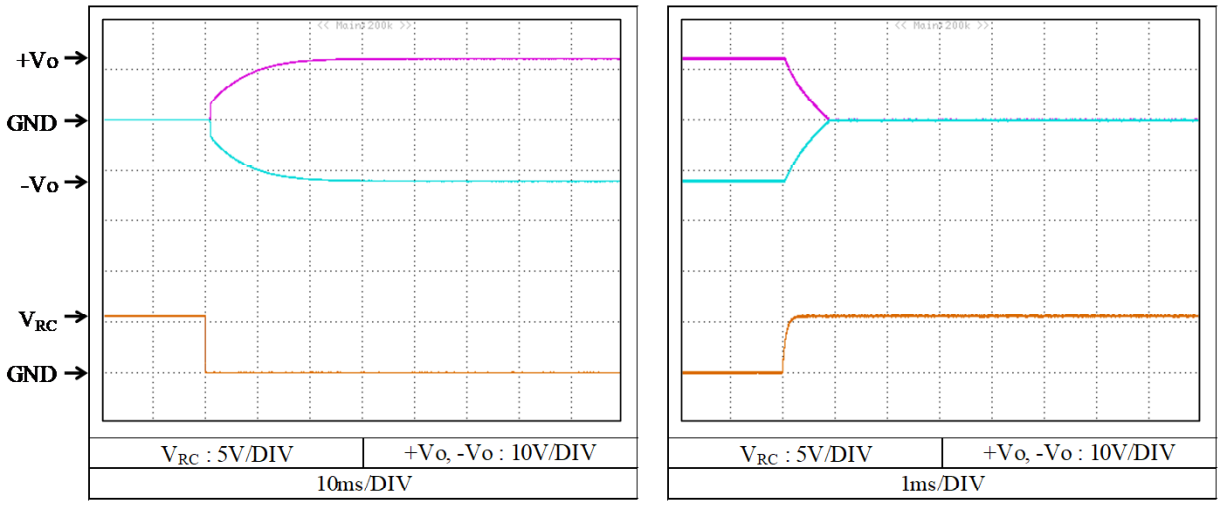


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

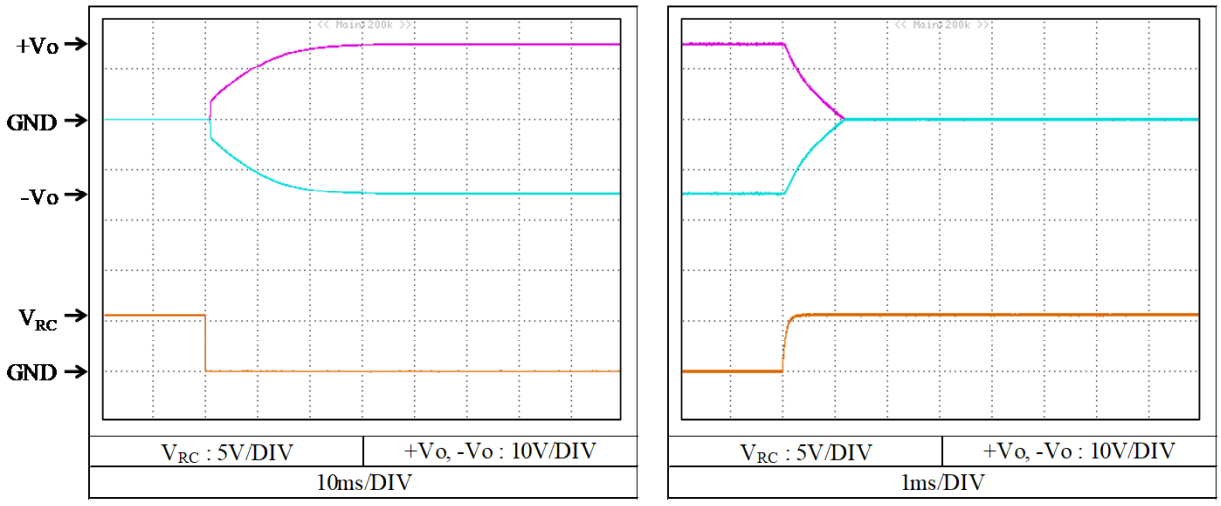
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 °C

±12V



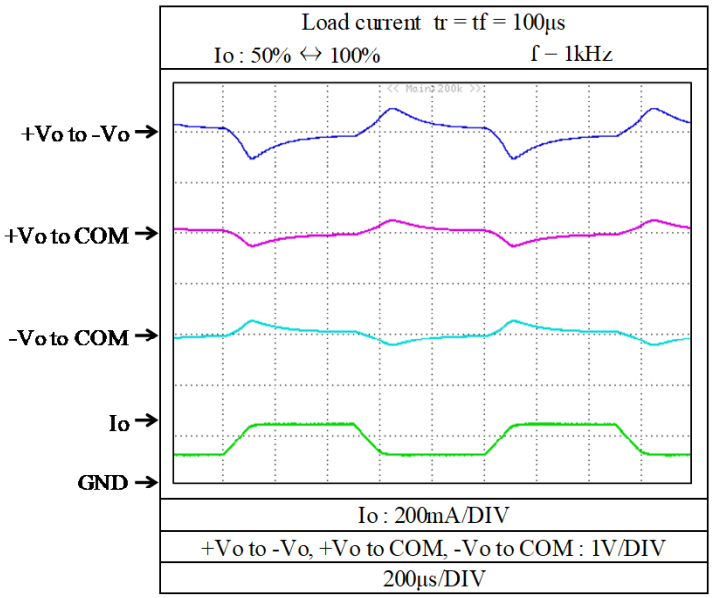
+15V



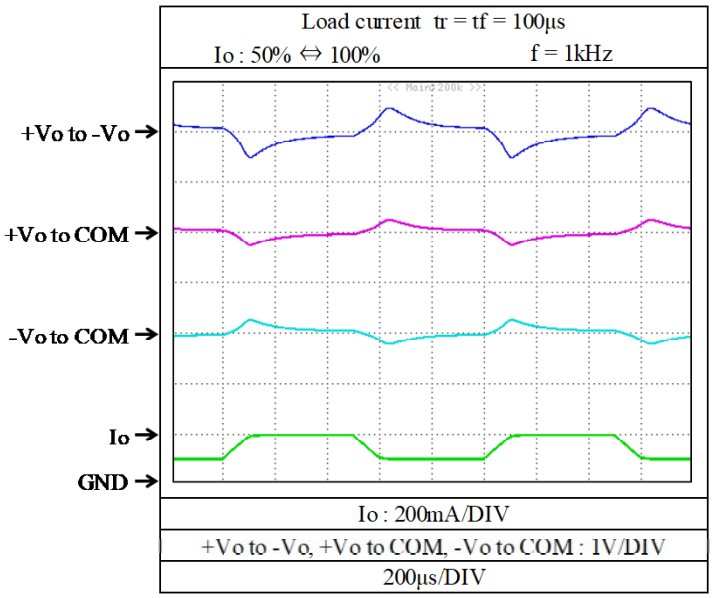
2-6. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions Vin : 48 VDC
Ta : 25 °C

±12V



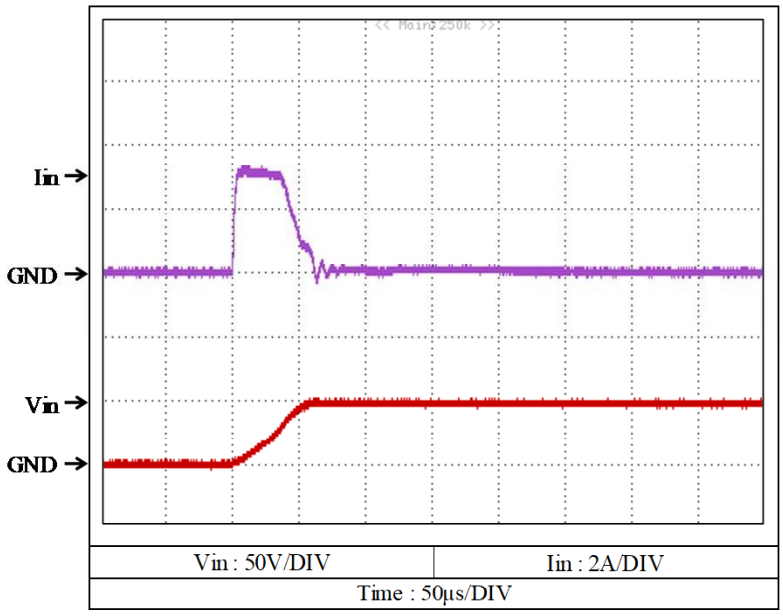
+15V



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 °C

CCG10-48-05S

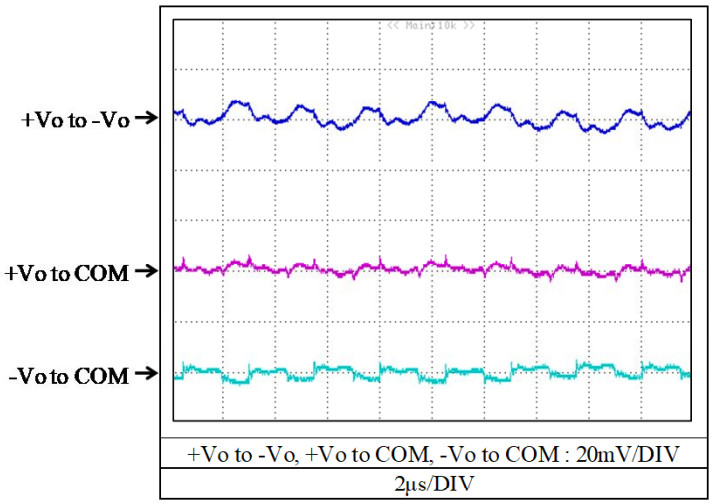


CCG6-48-xxDの入力サージ電流特性は CCG10-48-05S と同等です。
CCG6-48-xxD have the same Inrush current characteristics as CCG10-48-05S data.

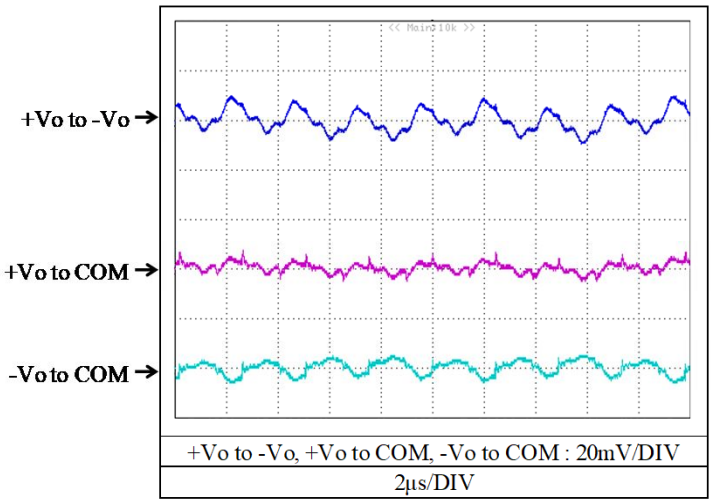
2-8. 出力リップルノイズ波形 Output ripple and noise waveform

Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 °C

±12V



+15V

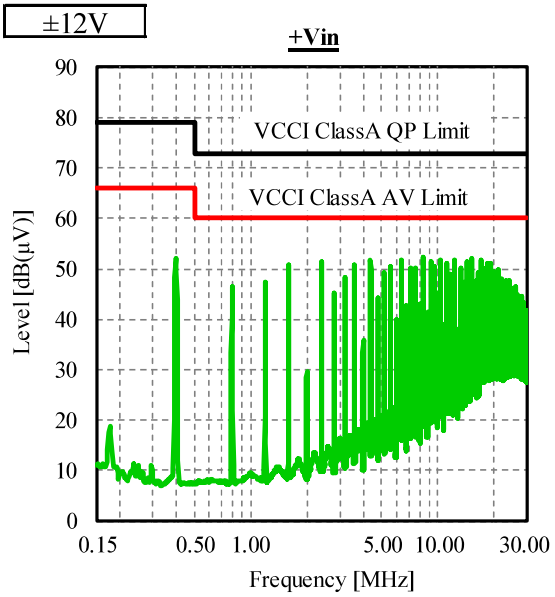


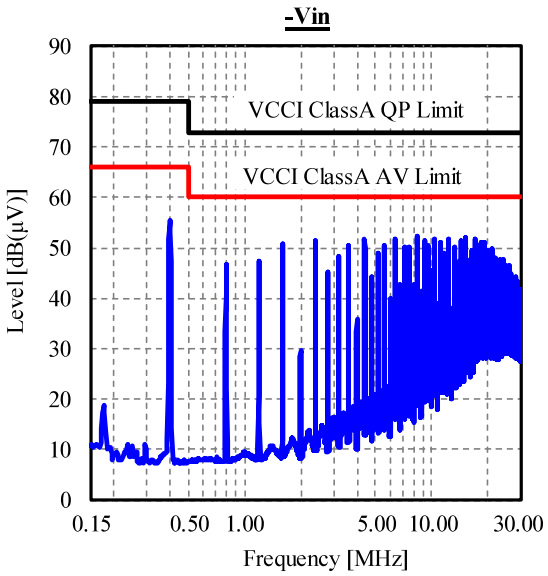
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

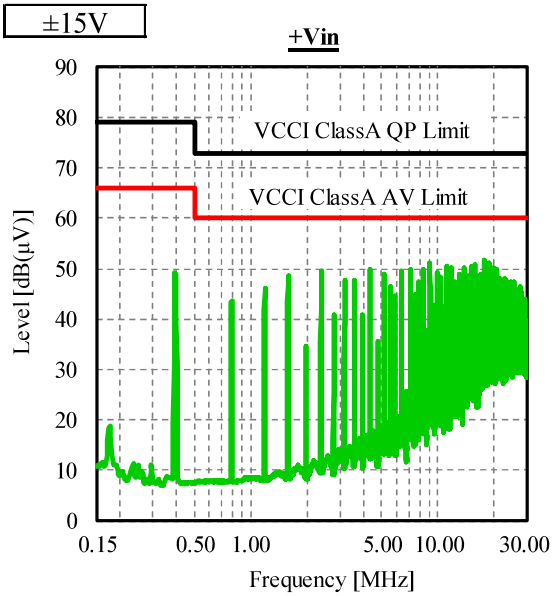
Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ℃

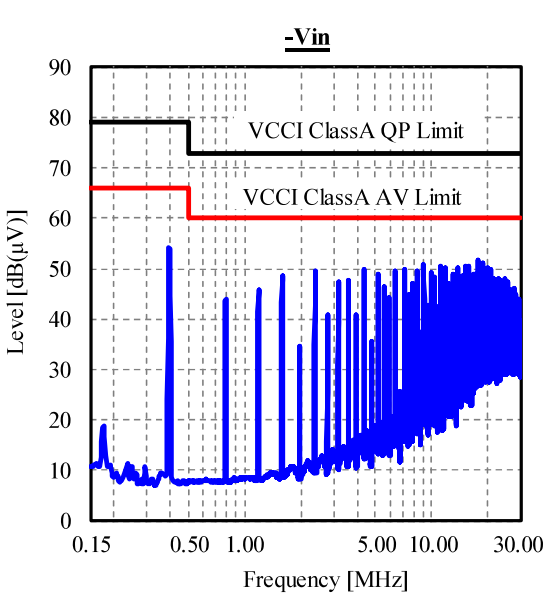
±12V





±15V





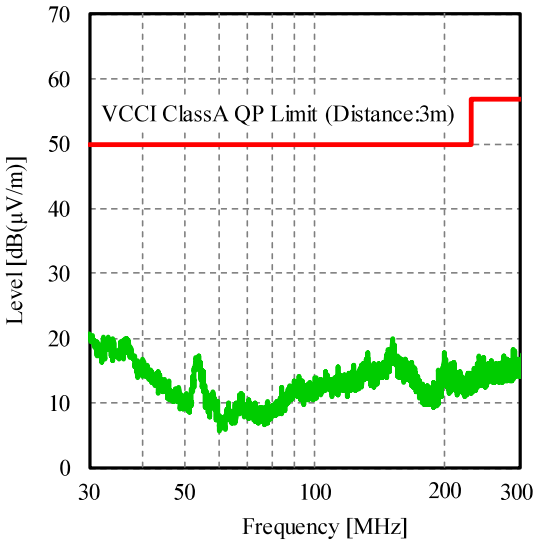
表示はQP値
Indication is QP values.

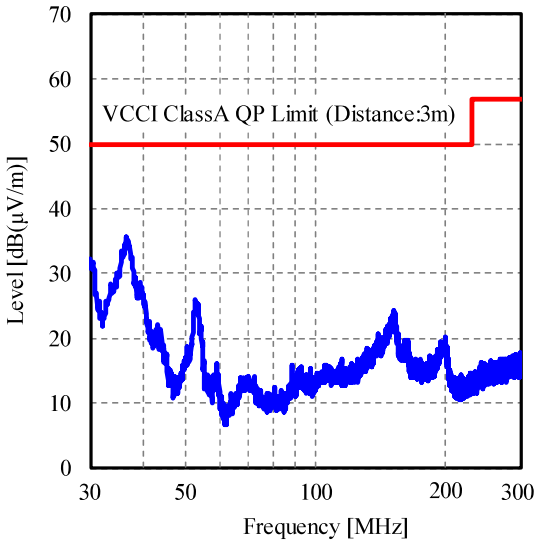
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

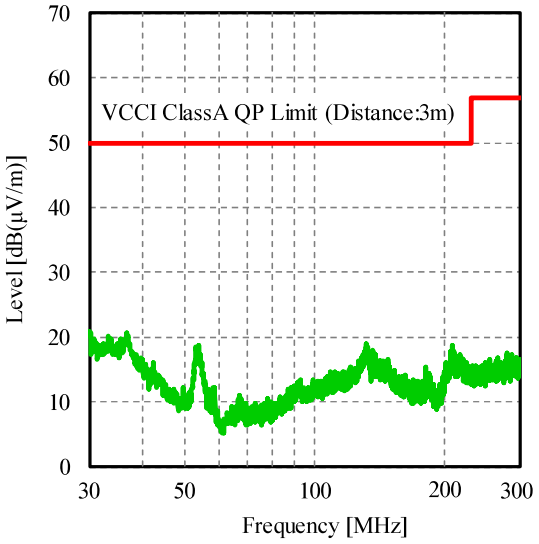
Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ℃

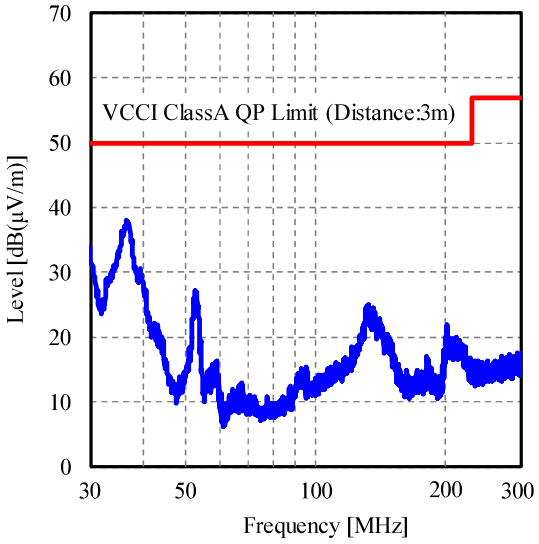
±12V





±15V





表示はピーク値
Indication is peak values.