CCG10-48-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

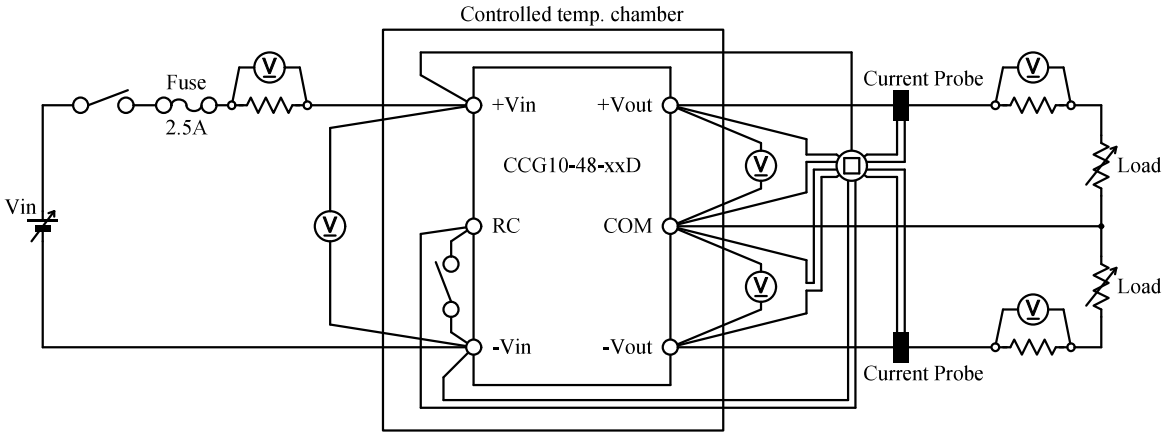
※ 当社測定条件における結果であり、参考値としてお考え願います。
Test results are reference data based on our measurement condition.

1. 測定方法 Evaluation Method

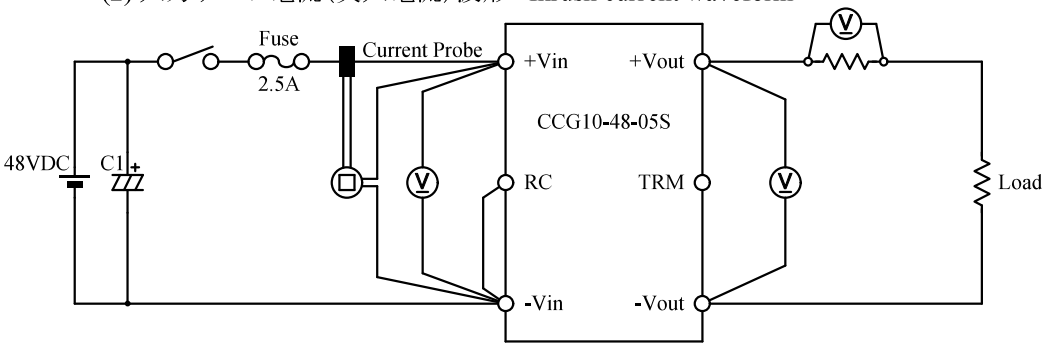
1-1. 測定回路 Measurement Circuits

(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



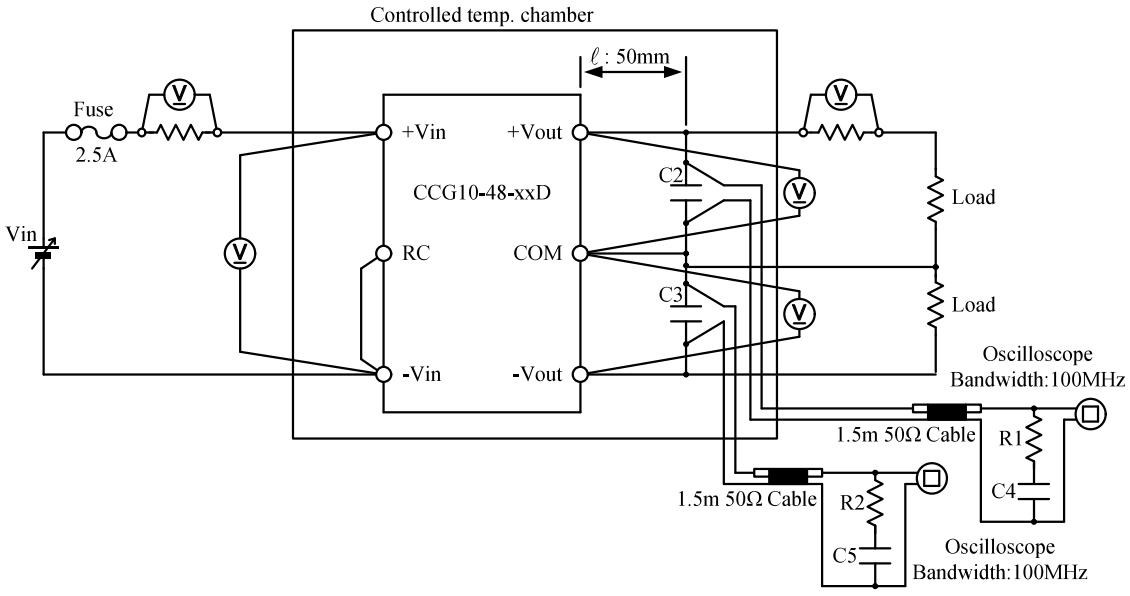
(2) 入力サージ電流(突入電流)波形 Inrush current waveform



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

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

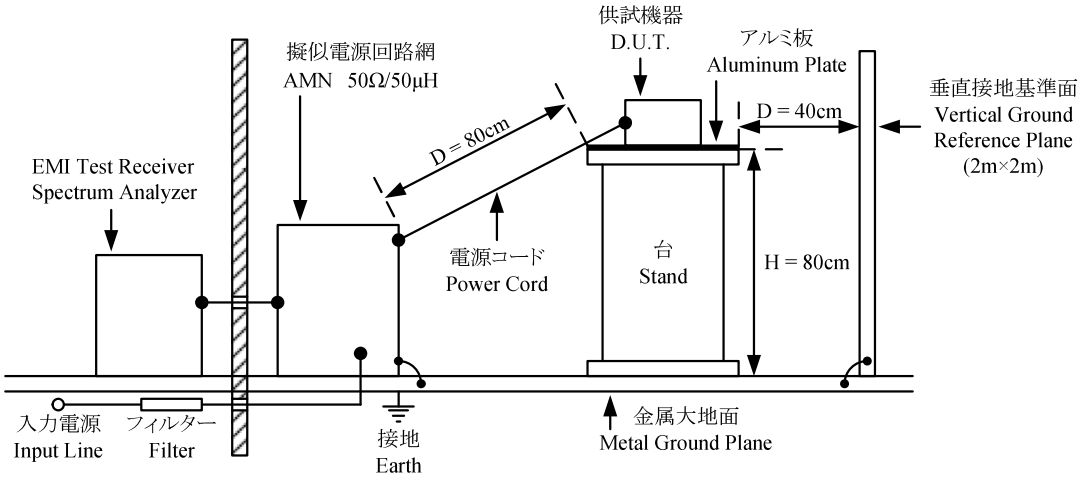
(3) 出力リップルノイズ電圧、波形 Output ripple and noise voltage and waveform



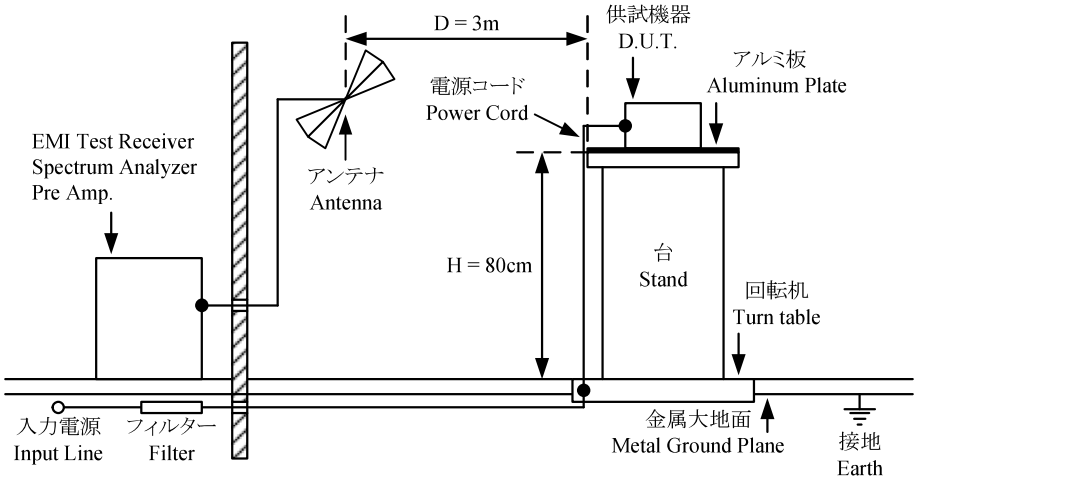
C1	: 4000uF	Electrolytic Capacitor
C2,C3	: 1uF	Ceramic Capacitor
C4,C5	: 4700pF	Ceramic Capacitor
R1,R2	: 50Ω	

(4) EMI特性　Electro-Magnetic Interference characteristics

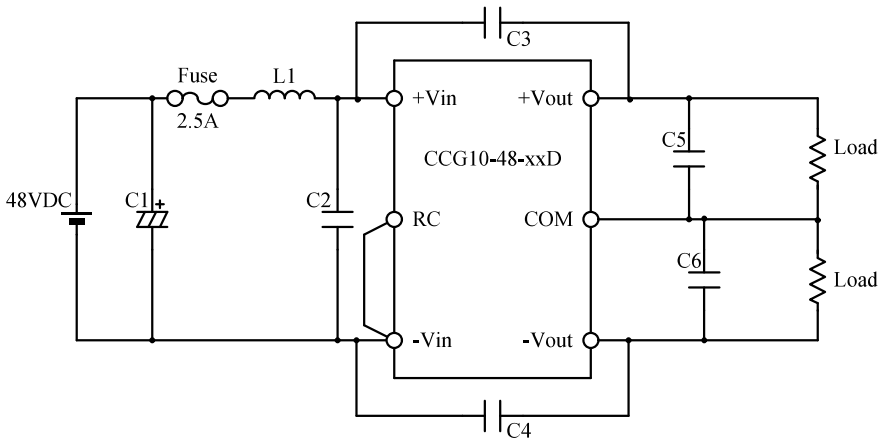
(a) 雑音端子電圧(帰還ノイズ) Conducted Emission Noise



(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%	12.0097V	12.0227V	12.0210V	12.0189V	13.0mV	0.108%
50%(0.21A)	11.9780V	11.9785V	11.9767V	11.9793V	2.6mV	0.022%
100%(0.42A)	11.9806V	11.9797V	11.9770V	11.9756V	5.0mV	0.042%
Load	31.7mV	44.2mV	44.3mV	43.3mV		
regulation	0.264%	0.368%	0.369%	0.361%		

・−Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	-11.9870V	-11.9759V	-11.9782V	-11.9797V	11.1mV	0.093%
50%(0.21A)	-12.0169V	-12.0181V	-12.0209V	-12.0176V	4.0mV	0.033%
100%(0.42A)	-12.0168V	-12.0184V	-12.0215V	-12.0221V	5.3mV	0.044%
Load	29.9mV	42.5mV	43.3mV	42.4mV		
regulation	0.249%	0.354%	0.361%	0.353%		

・+Vo to −Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	23.9967V	23.9986V	23.9992V	23.9986V	2.5mV	0.010%
50%(0.21A)	23.9948V	23.9966V	23.9975V	23.9969V	2.7mV	0.011%
100%(0.42A)	23.9973V	23.9981V	23.9985V	23.9976V	1.2mV	0.005%
Load	2.5mV	2.0mV	1.7mV	1.7mV		
regulation	0.010%	0.008%	0.007%	0.007%		

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

Ta	-40°C	25°C	60°C	Temperature stability	
+Vo	11.9064V	11.9770V	11.9861V	79.7mV	0.664%
-Vo	-11.9471V	-12.0215V	-12.0323V	85.2mV	0.710%
+Vo to -Vo	23.8536V	23.9985V	24.0184V	164.8mV	0.687%

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

・+Vo (-Io : 100%)

+Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.084A)	12.1885V	12.1634V	12.1634V	12.1465V
100%(0.42A)	11.9834V	11.9817V	11.9817V	11.9777V
Load	205.1mV	181.7mV	181.7mV	168.8mV
regulation	1.709%	1.514%	1.514%	1.407%

・−Vo (+Io : 100%)

-Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.084A)	-12.2199V	-12.1963V	-12.1963V	-12.1838V
100%(0.42A)	-12.0189V	-12.0203V	-12.0203V	-12.0232V
Load	201.0mV	176.0mV	176.0mV	160.6mV
regulation	1.675%	1.467%	1.467%	1.338%

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

・+Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	14.9988V	15.0022V	15.0036V	15.0027V	4.8mV	0.032%
50%(0.17A)	14.9855V	14.9874V	14.9863V	14.9857V	1.9mV	0.013%
100%(0.34A)	14.9797V	14.9837V	14.9886V	14.9877V	8.9mV	0.059%
Load	19.1mV	18.5mV	17.3mV	17.0mV		
regulation	0.127%	0.123%	0.115%	0.113%		

・−Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	-15.0001V	-14.9988V	-14.9975V	-14.9981V	2.6mV	0.017%
50%(0.17A)	-15.0125V	-15.0115V	-15.0132V	-15.0141V	2.6mV	0.017%
100%(0.34A)	-15.0193V	-15.0161V	-15.0114V	-15.0119V	7.9mV	0.053%
Load	19.2mV	17.3mV	15.7mV	16.0mV		
regulation	0.128%	0.115%	0.105%	0.107%		

・+Vo to −Vo

Io \ Vin	18VDC	24VDC	48VDC	76VDC	Line regulation	
0%	29.9988V	30.0010V	30.0011V	30.0008V	2.3mV	0.008%
50%(0.17A)	29.9980V	29.9989V	29.9996V	29.9998V	1.8mV	0.006%
100%(0.34A)	29.9990V	29.9998V	30.0000V	29.9997V	1.0mV	0.003%
Load	1.0mV	2.1mV	1.5mV	1.1mV		
regulation	0.003%	0.007%	0.005%	0.004%		

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

Ta	-40°C	25°C	65°C	Temperature stability	
+Vo	14.9167V	14.9886V	14.9780V	71.9mV	0.479%
-Vo	-14.9365V	-15.0114V	-15.0039V	74.9mV	0.499%
+Vo to -Vo	29.8532V	30.0000V	29.9820V	146.8mV	0.489%

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

・+Vo (-Io : 100%)

+Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.068A)	15.1660V	15.1436V	15.1436V	15.1299V
100%(0.34A)	14.9821V	14.9859V	14.9859V	14.9890V
Load	183.9mV	157.7mV	157.7mV	140.9mV
regulation	1.226%	1.051%	1.051%	0.939%

・−Vo (+Io : 100%)

-Io \ Vin	18VDC	24VDC	48VDC	76VDC
20%(0.068A)	-15.1996V	-15.1795V	-15.1795V	-15.1739V
100%(0.34A)	-15.0208V	-15.0168V	-15.0168V	-15.0122V
Load	178.8mV	162.7mV	162.7mV	161.7mV
regulation	1.192%	1.085%	1.085%	1.078%

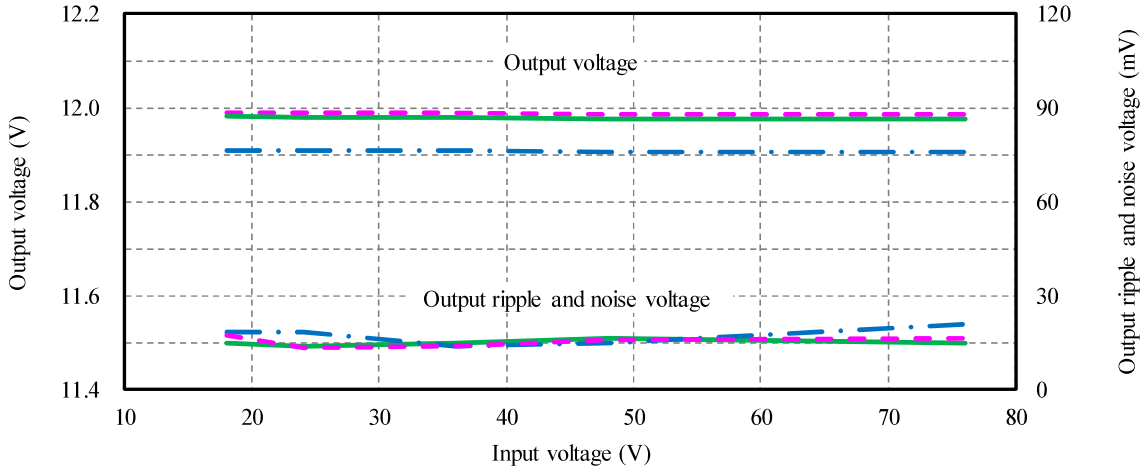
(2) 出力電圧・出力リップルノイズ電圧 対 入力電圧

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

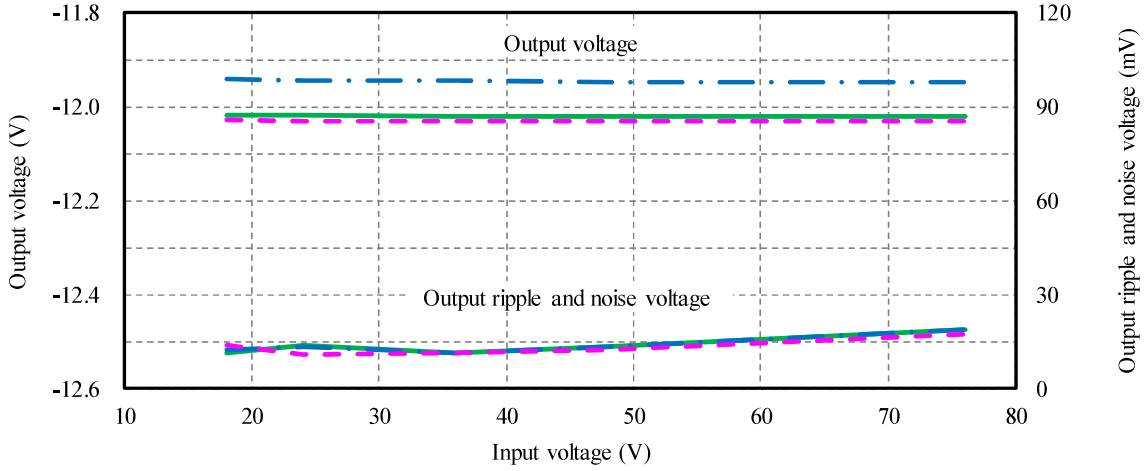
Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 60 °C

±12V

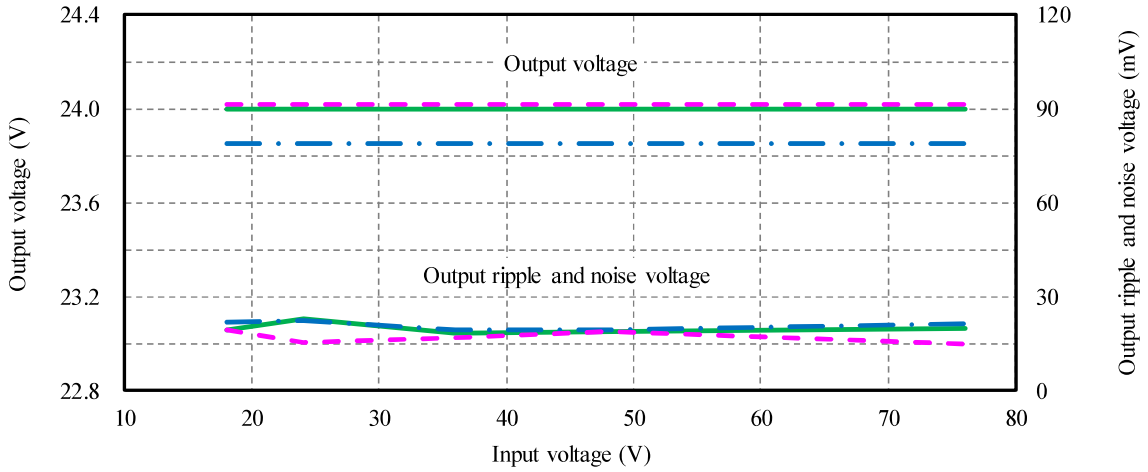
・+Vo



・−Vo



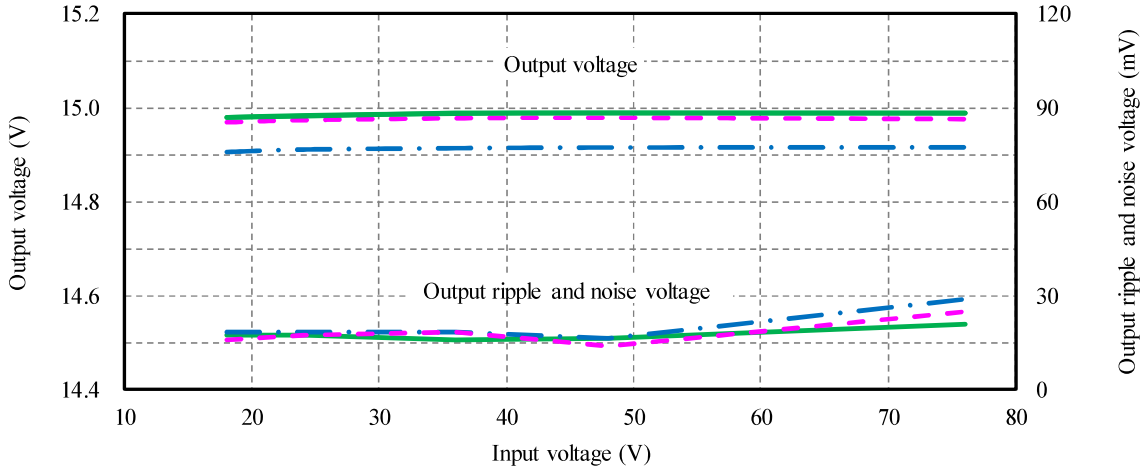
・+Vo to -Vo



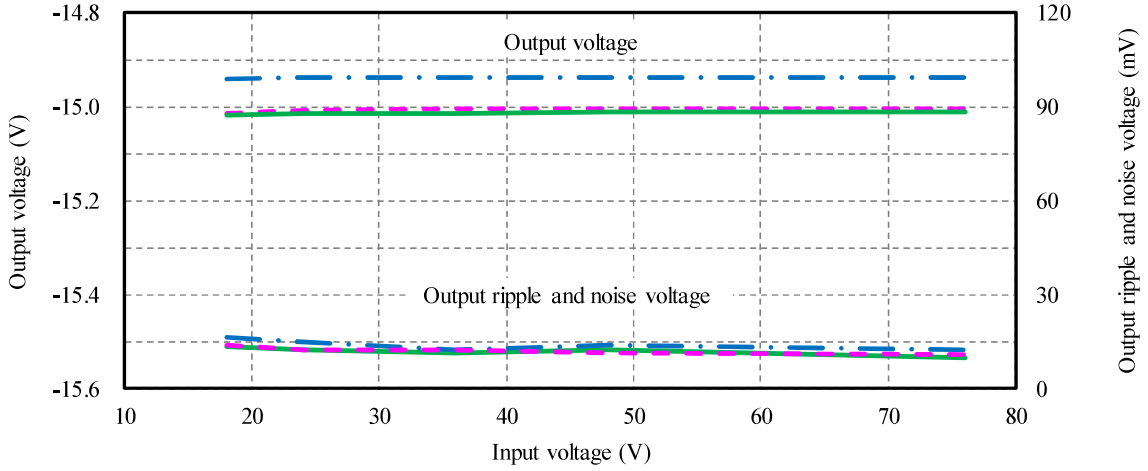
Conditions Io : 100 %
Ta : -40 °C
: 25 °C
: 65 °C

±15V

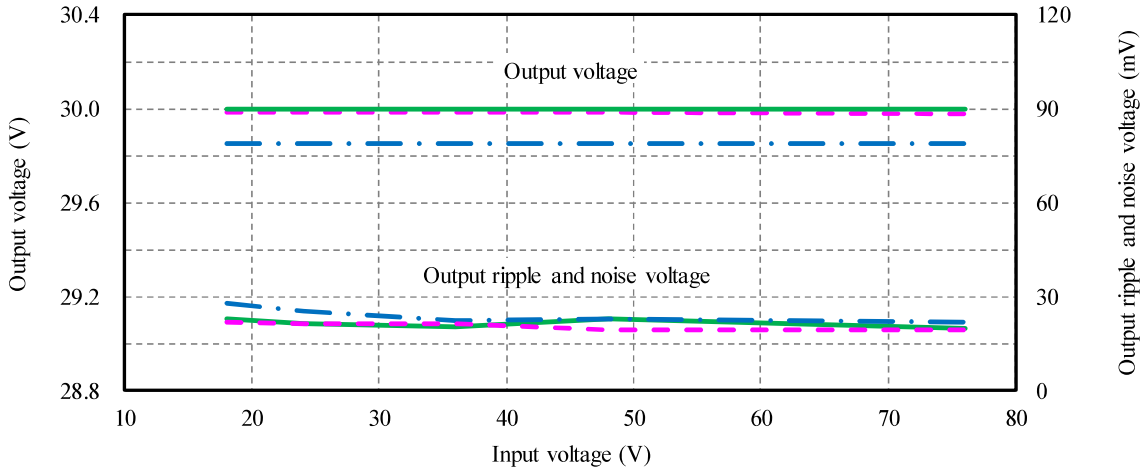
・+Vo



・−Vo



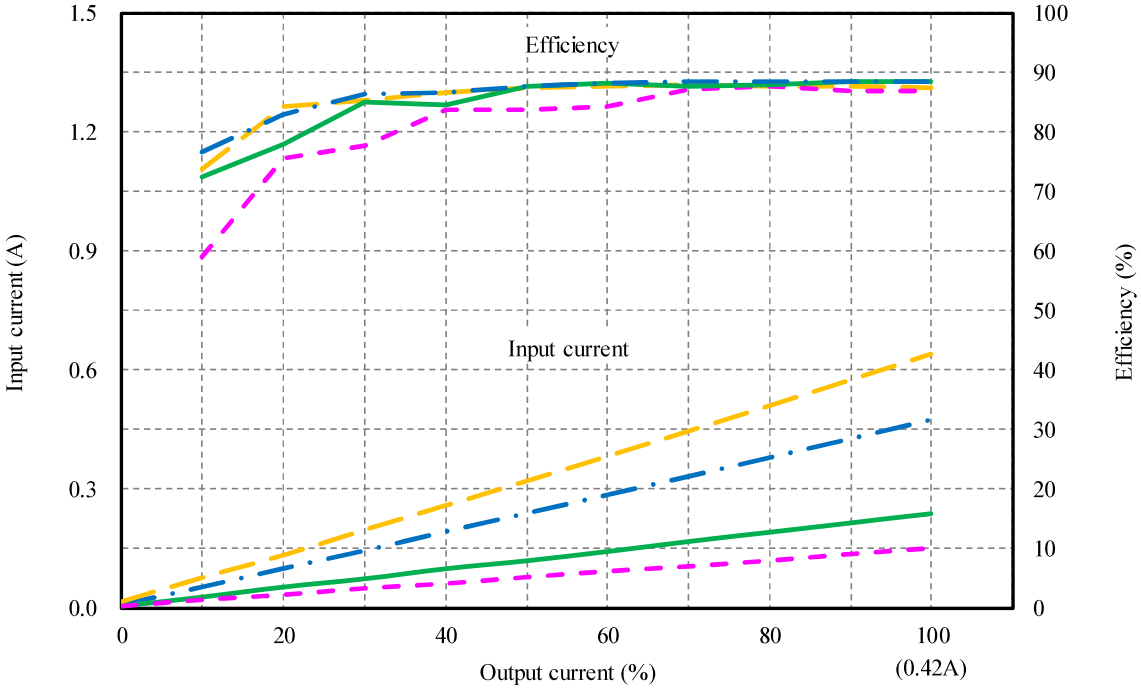
・+Vo to -Vo



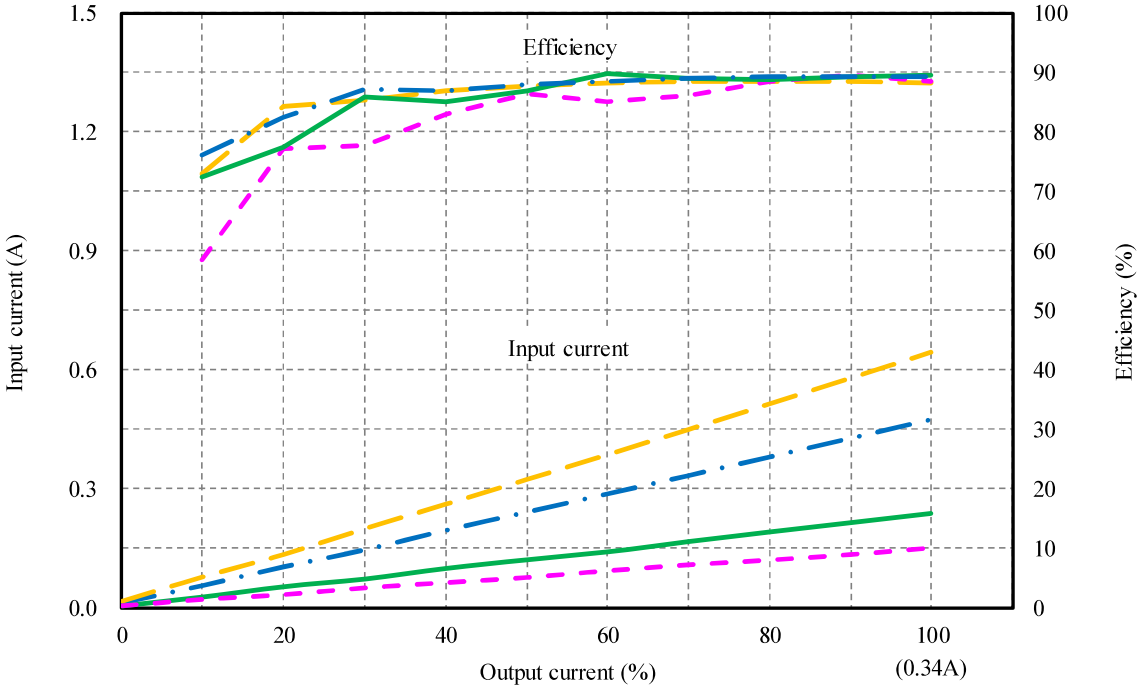
(3) 入力電流・効率 対 出力電流　Input current and Efficiency vs. Output current

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

±12V



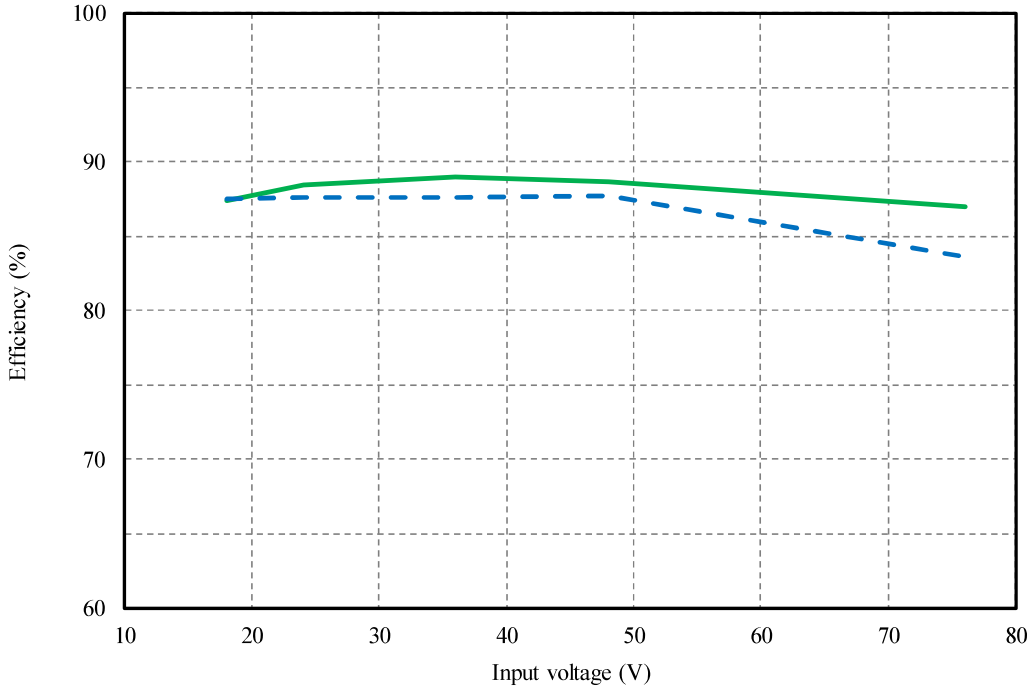
±15V



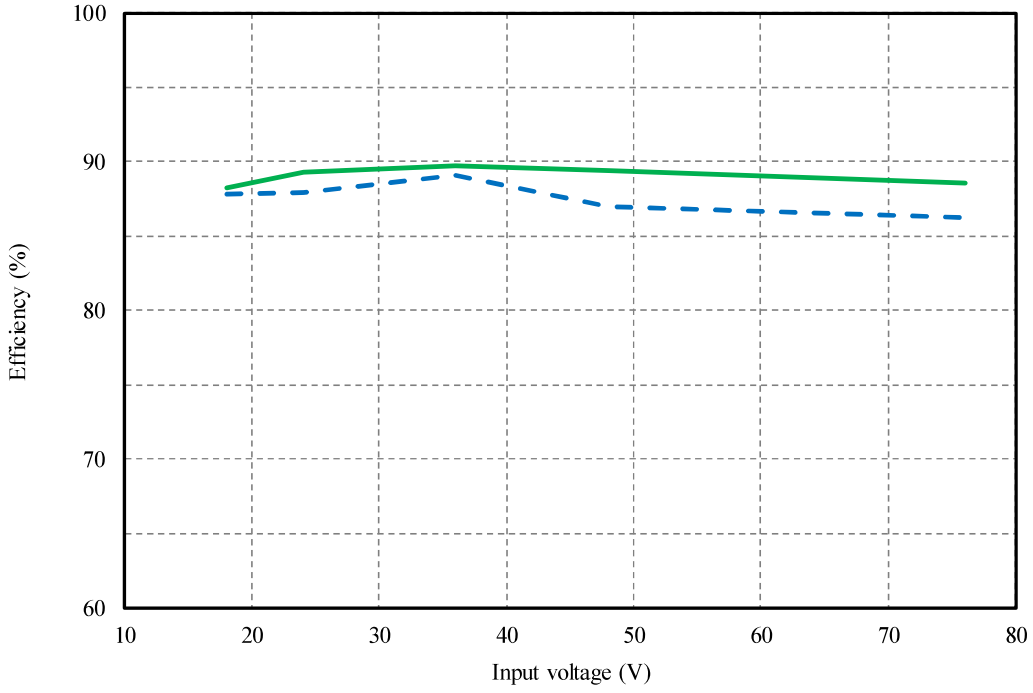
(4) 効率 対 入力電圧 Efficiency vs. Input voltage

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

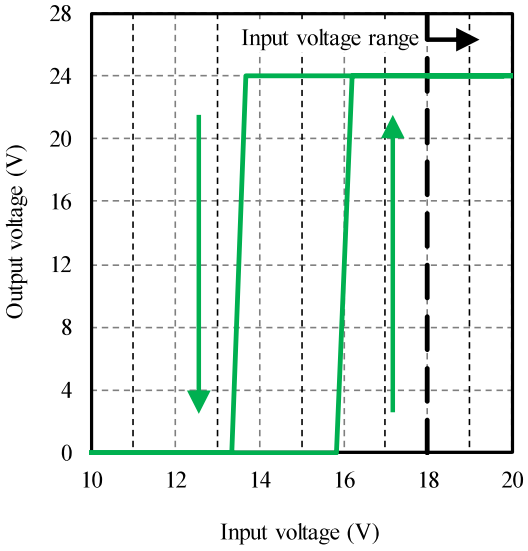
出力電圧 対 入力電圧
Output voltage vs. Input voltage

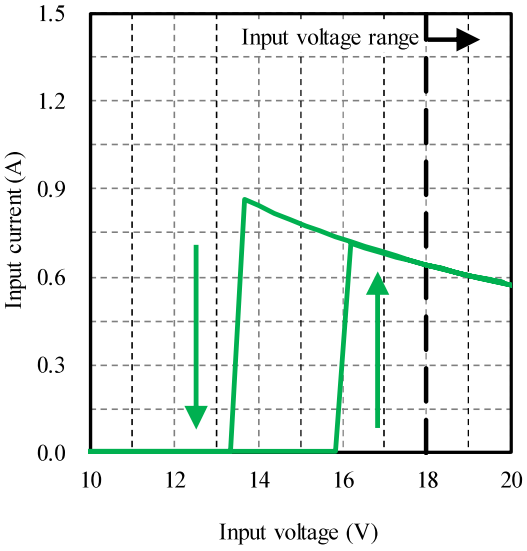
Conditions Io : 100 %
Ta : 25 °C

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

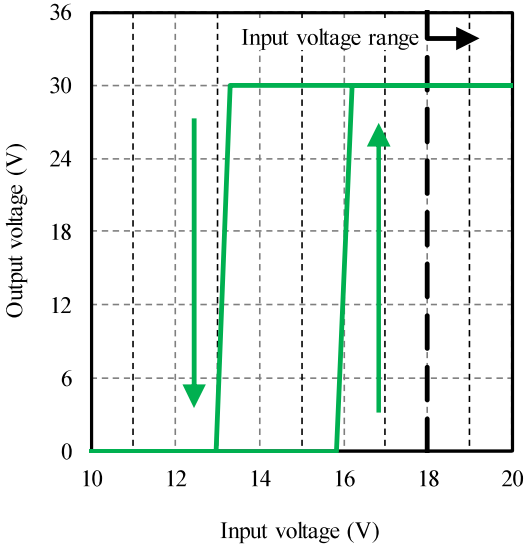
Conditions Io : 100 %
Ta : 25 °C

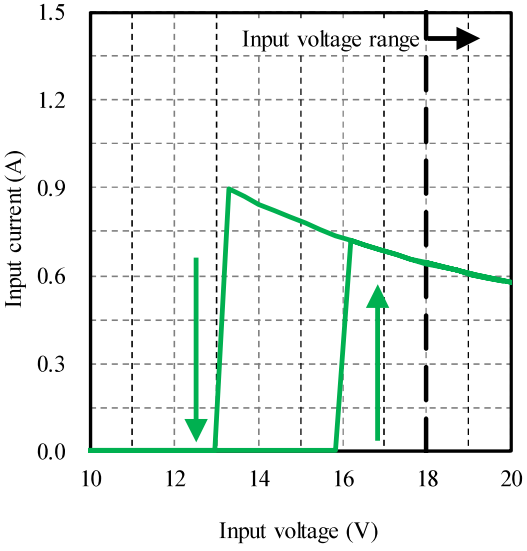
±12V





±15V

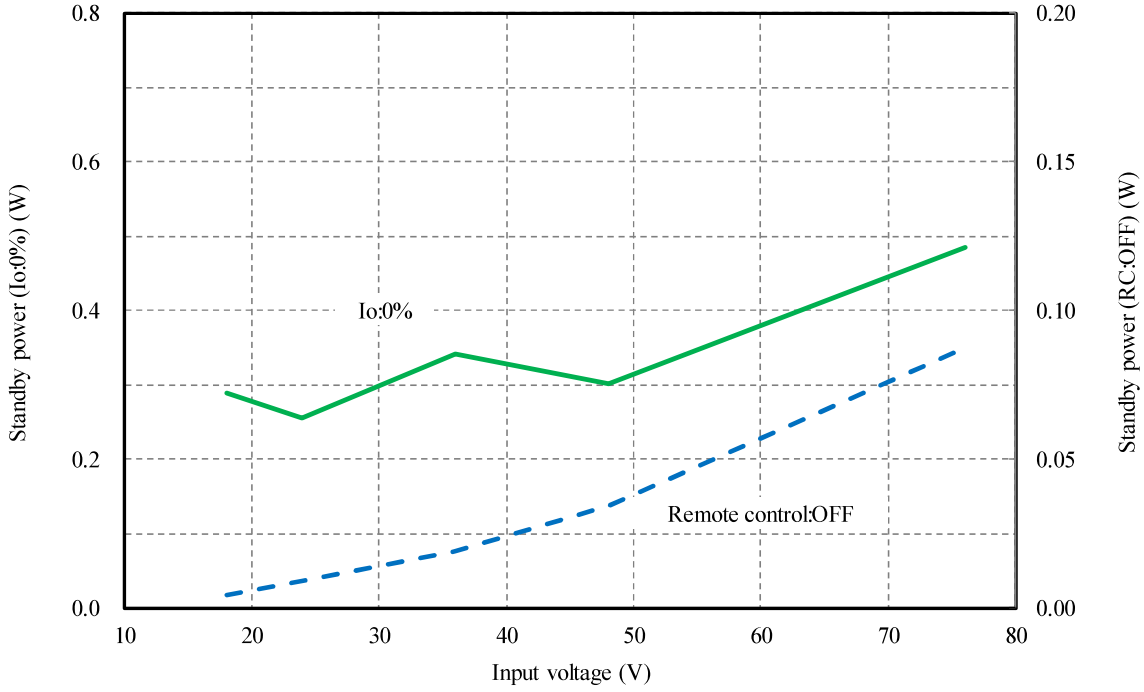




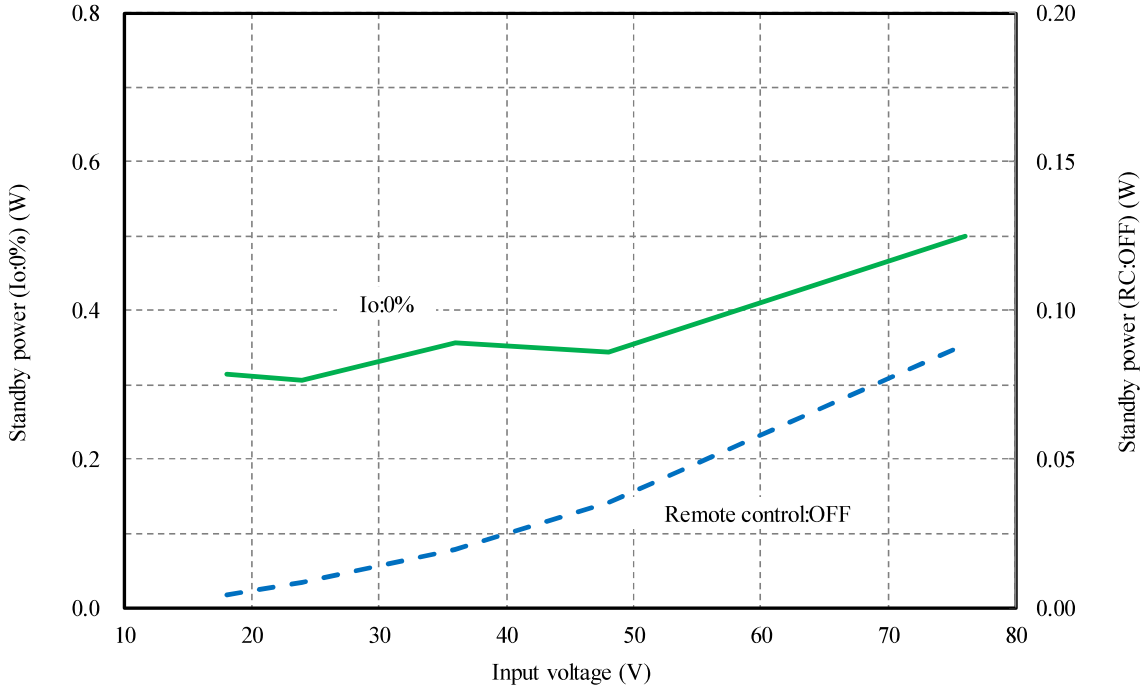
2-2. 待機電力特性 Standby power characteristics

Condition Ta : 25 °C

±12V



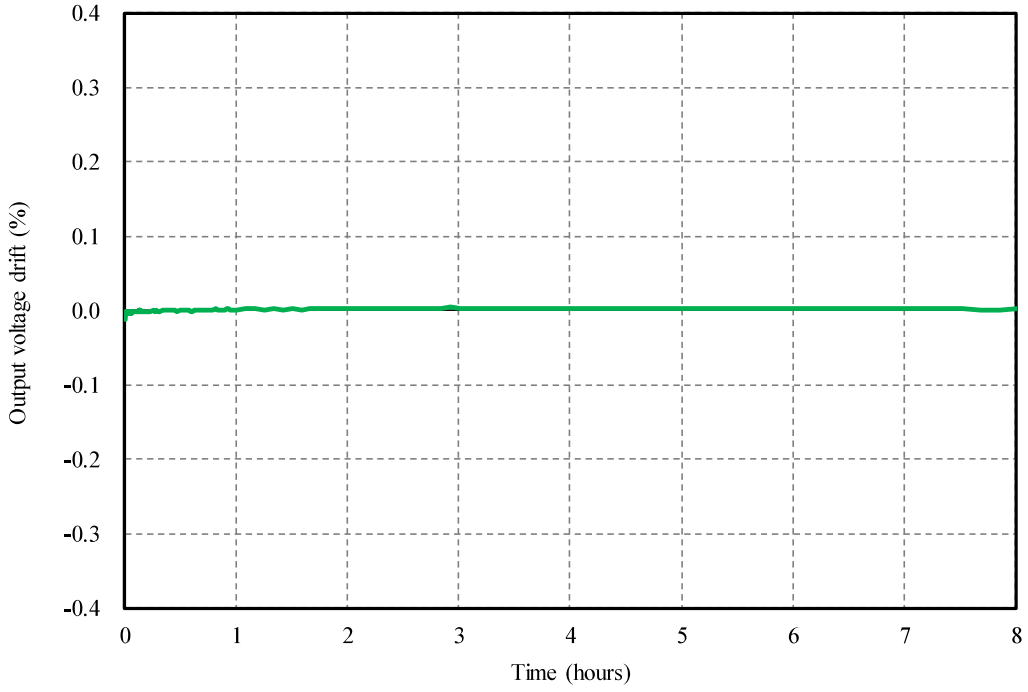
±15V



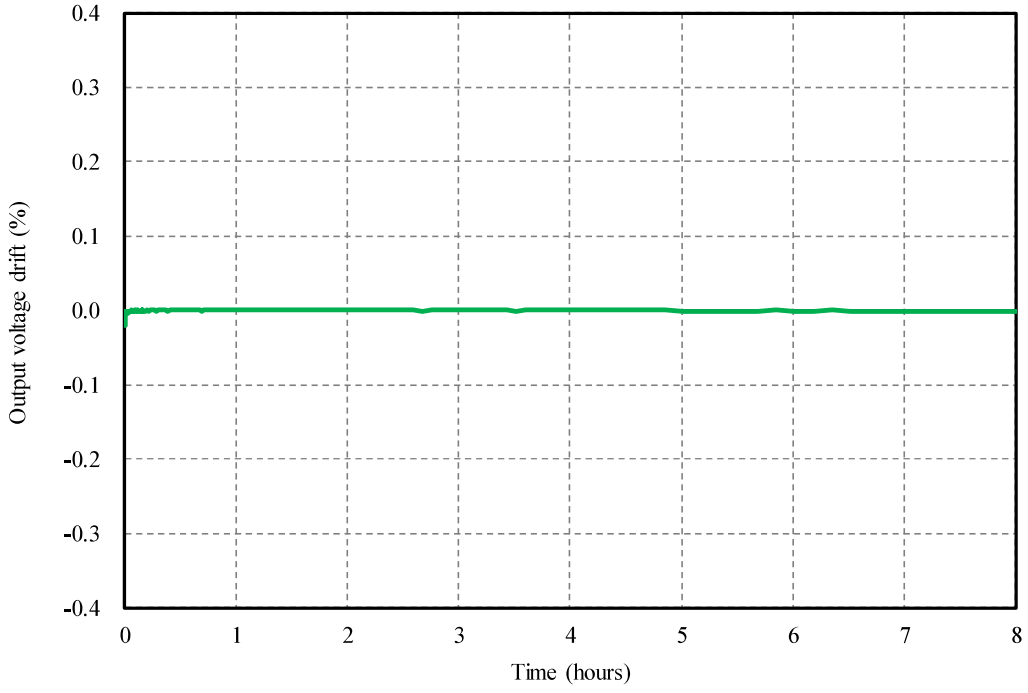
2-3. 通電ドリフト特性 Warm up voltage drift characteristics

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

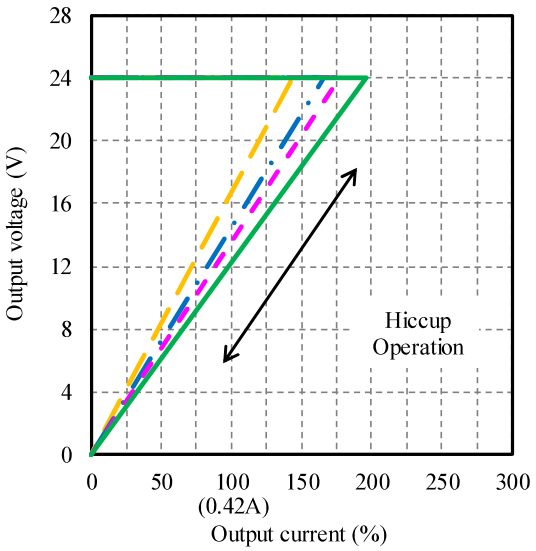
入力電圧依存性
Input voltage dependence

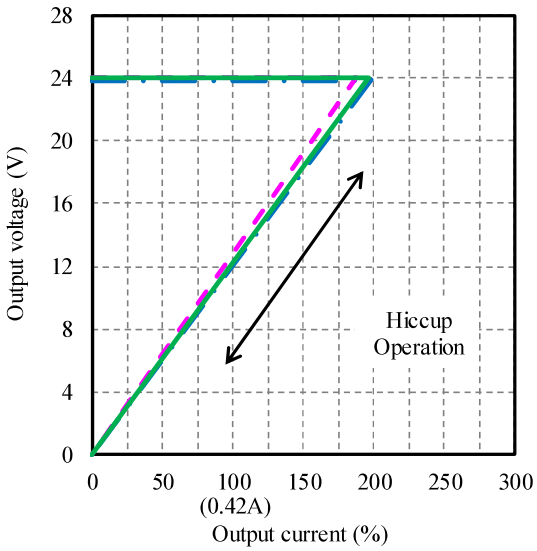
Conditions Vin : 18 VDC
: 24 VDC
: 48 VDC
: 76 VDC
Ta : 25 °C

周囲温度依存性
Ambient temperature dependence

Conditions Vin : 48 VDC
Ta : -40 °C
: 25 °C
: 60 °C

±12V

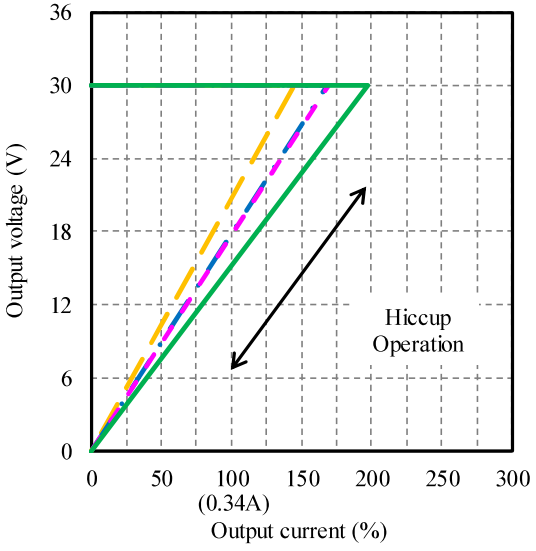


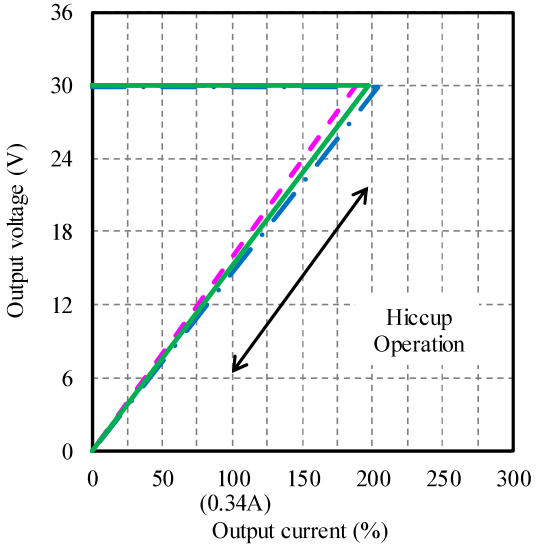


Conditions Vin : 18 VDC
: 24 VDC
: 48 VDC
: 76 VDC
Ta : 25 °C

Conditions Vin : 48 VDC
Ta : -40 °C
: 25 °C
: 65 °C

±15V

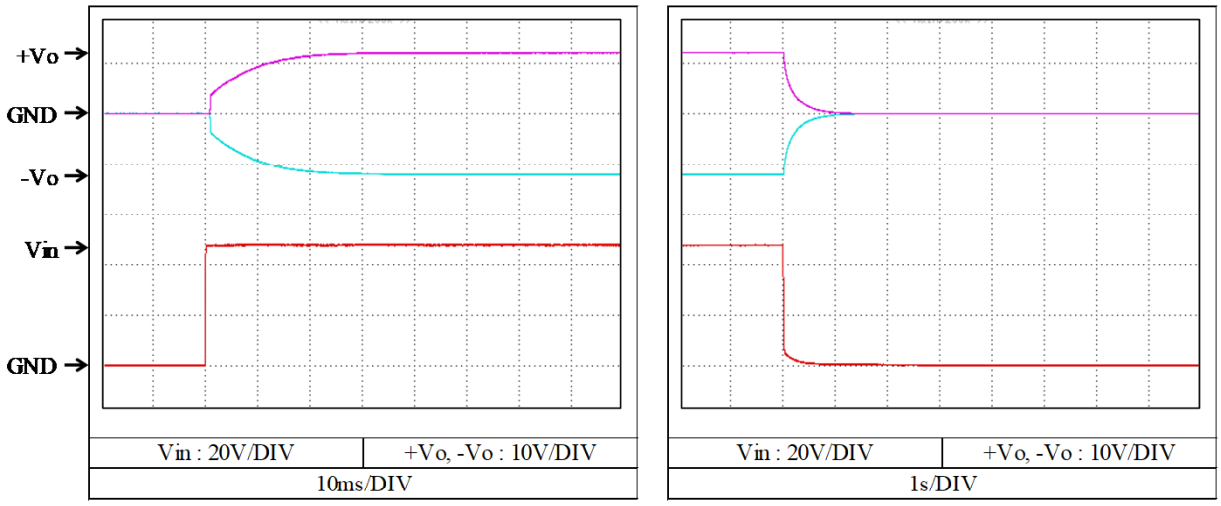




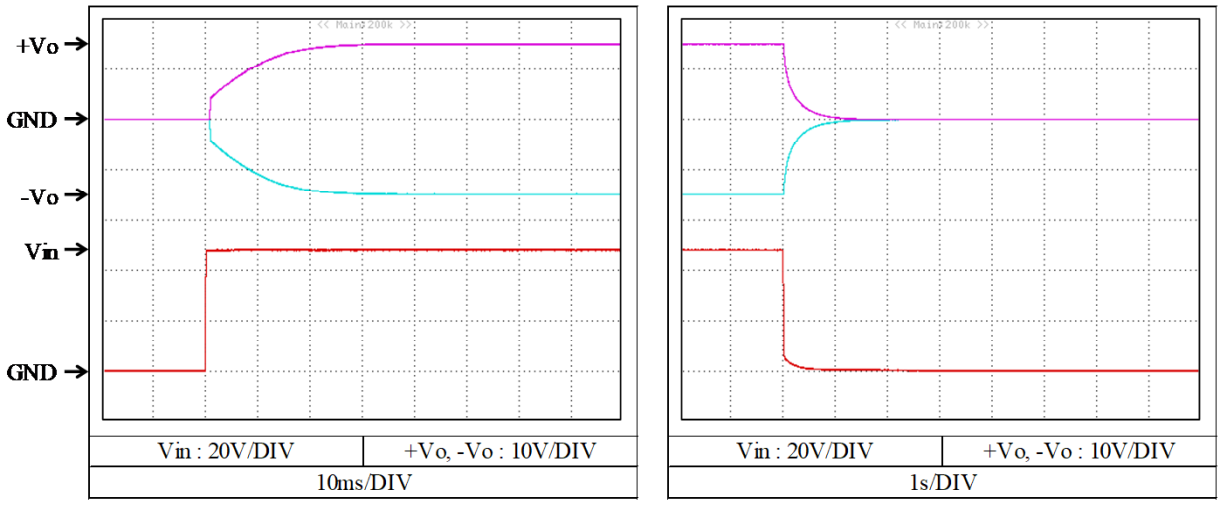
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

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

±12V



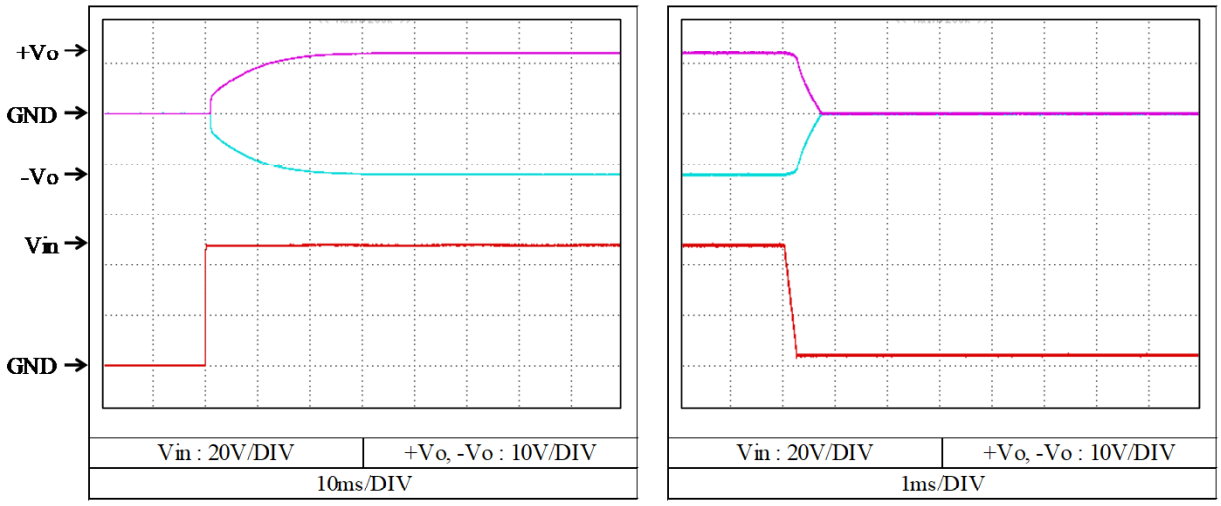
+15V



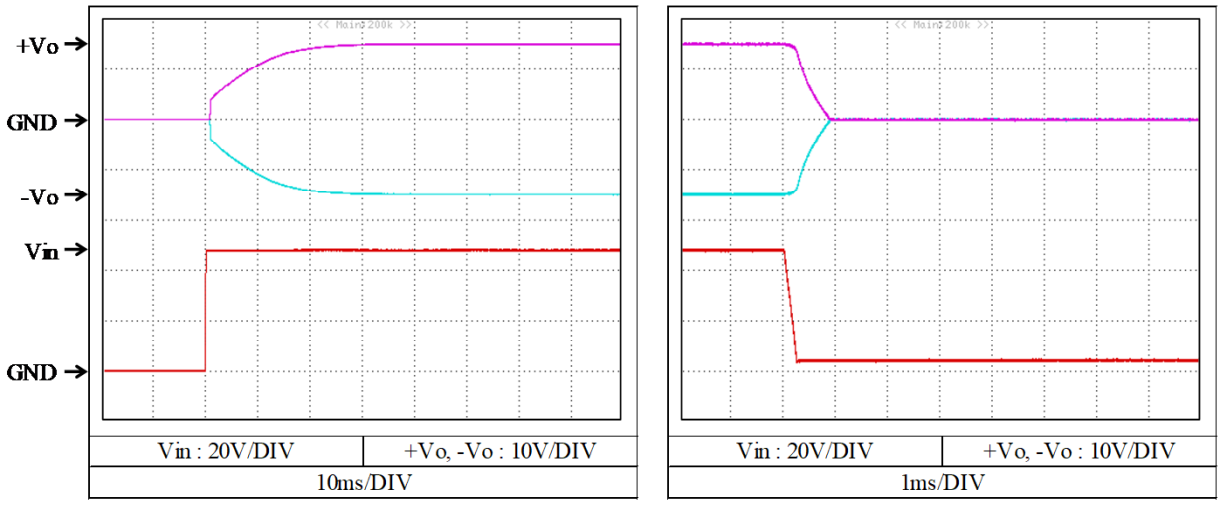
2-5. 出力立ち上がり・立ち下がり特性 Output rise and fall characteristics

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

±12V



+15V

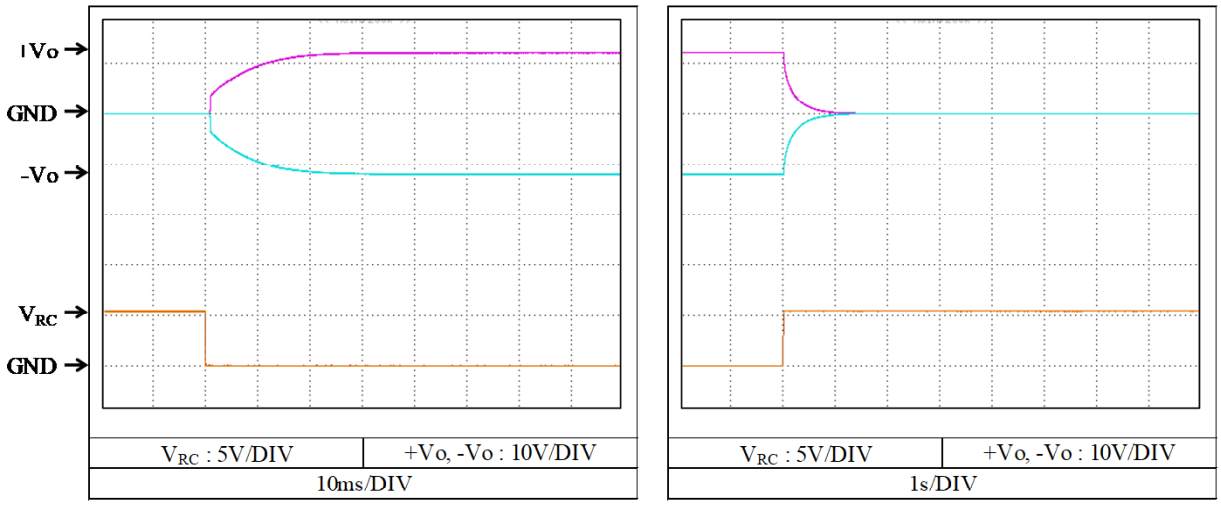


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

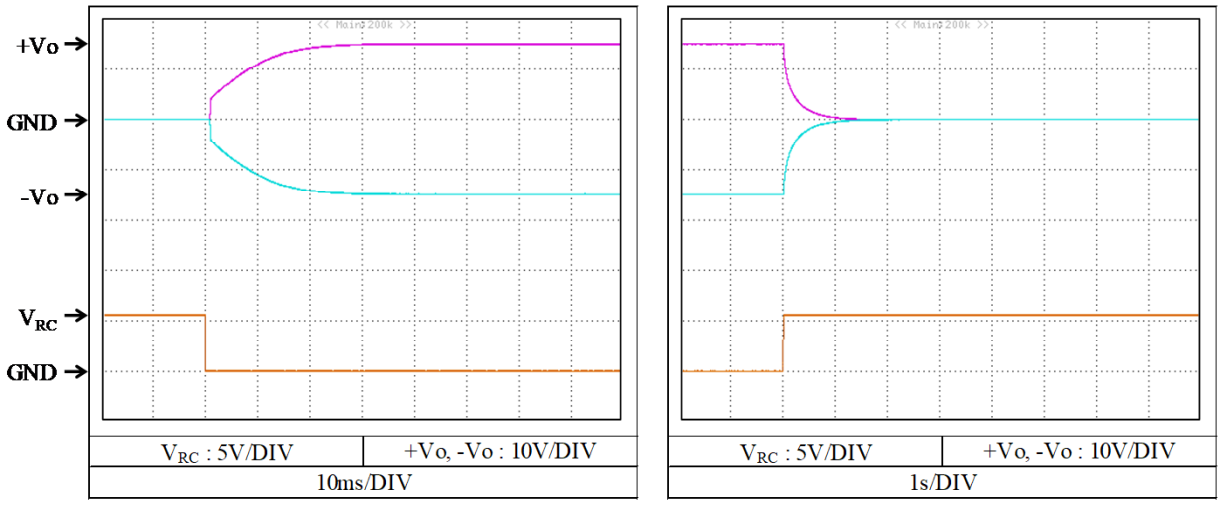
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

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

±12V



+15V

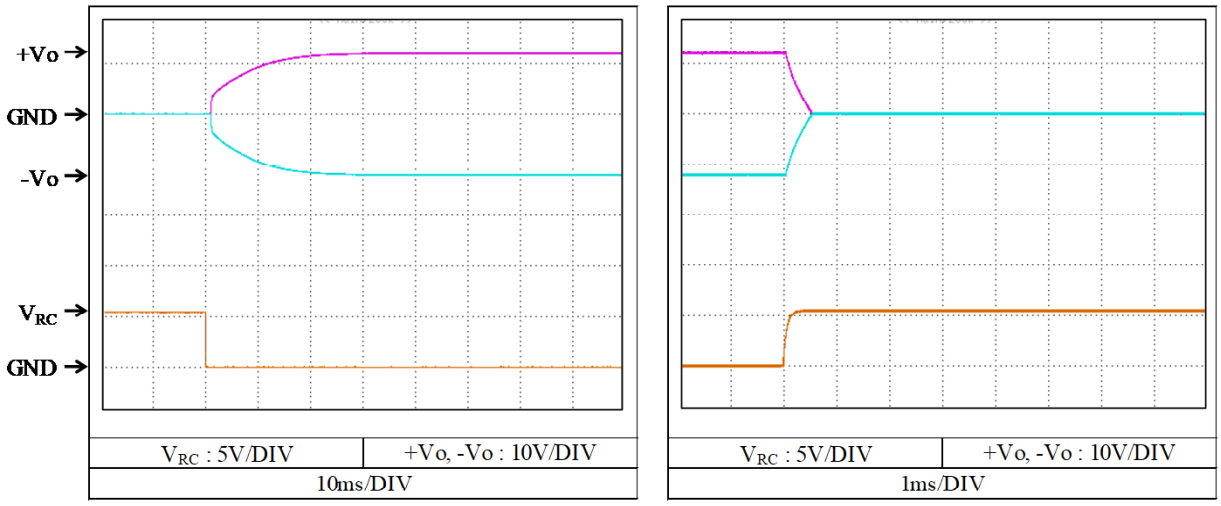


2-5. 出力立ち上がり・立ち下がり特性 (リモートON/OFFコントロール時)

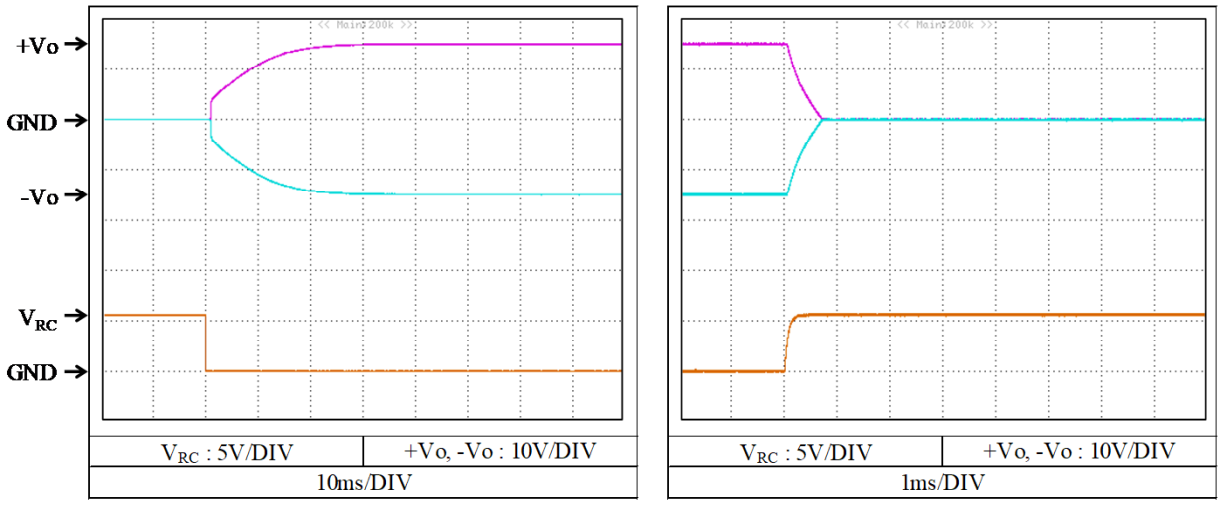
Output rise and fall characteristics with REMOTE ON/OFF CONTROL

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

±12V



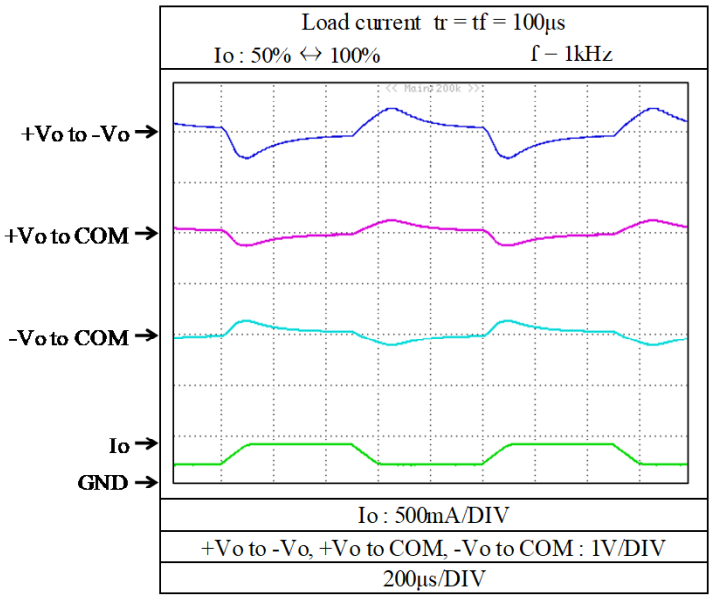
+15V



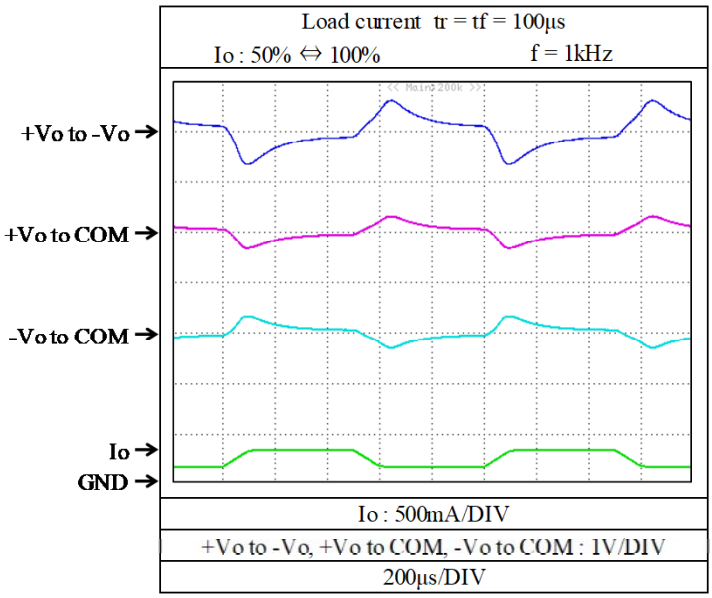
2-6. 過渡応答(負荷急変)特性 Dynamic load response characteristics

Conditions Vin : 48 VDC
Ta : 25 °C

±12V



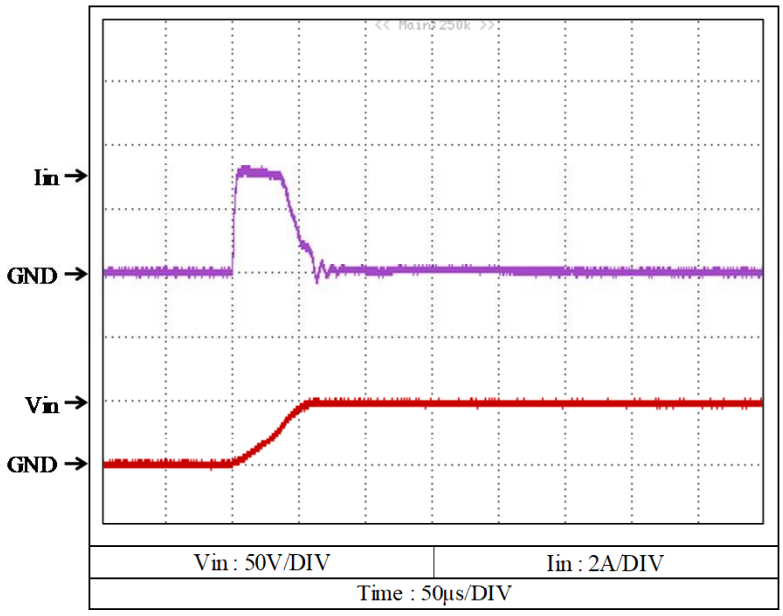
+15V



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

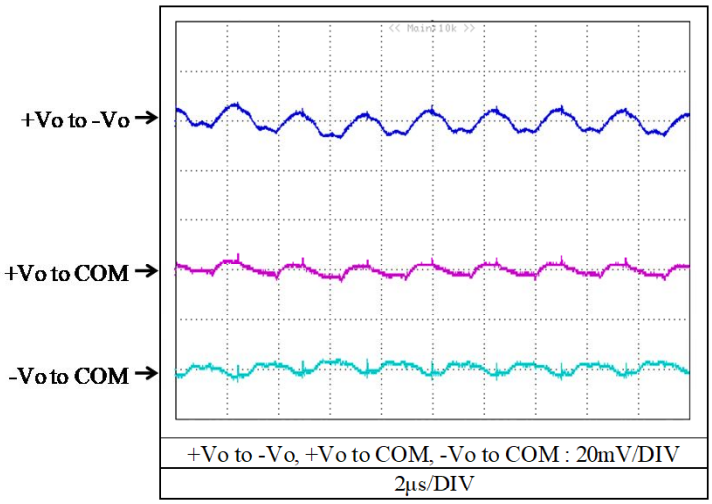


CCG10-48-xxDの入力サージ電流特性は CCG10-48-05S と同等です。
CCG10-48-xxD have the same Inrush current characteristics as CCG10-48-05S data.

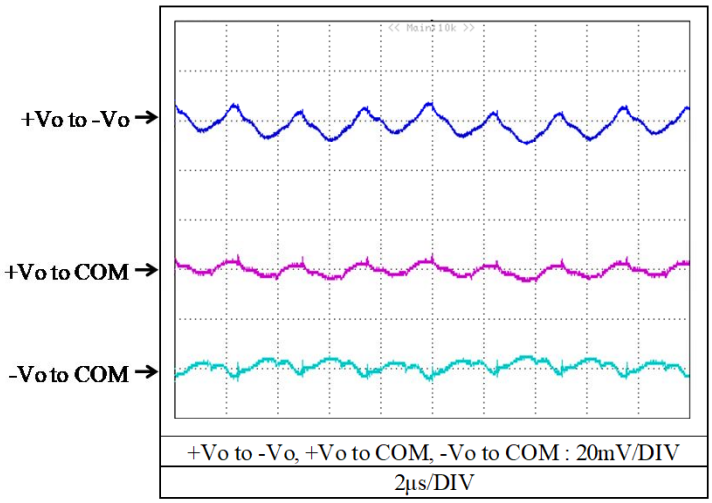
2-8. 出力リップルノイズ波形 Output ripple and noise waveform

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

±12V



+15V

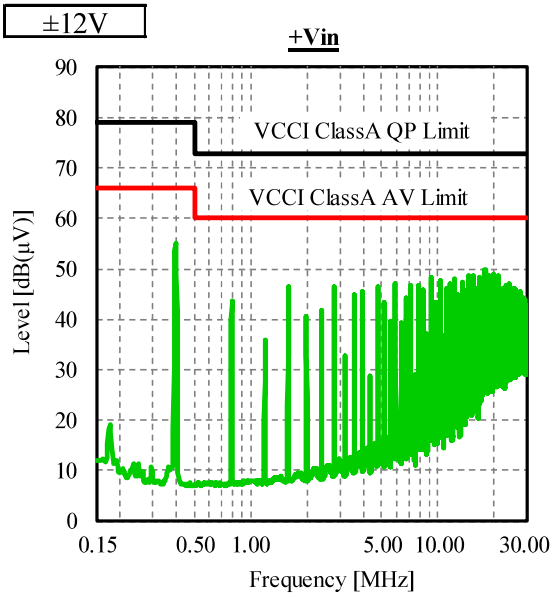


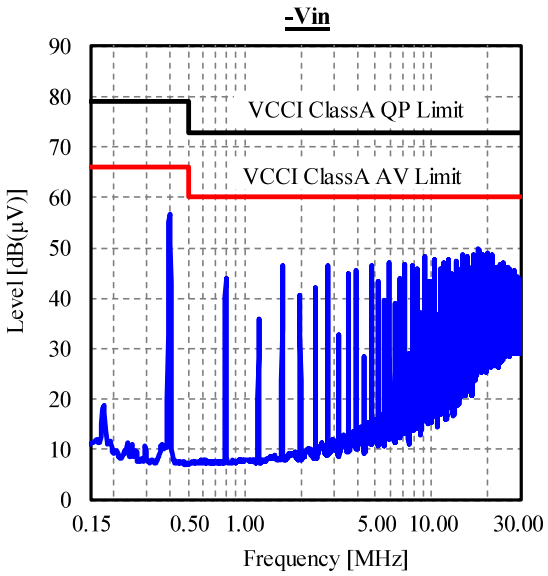
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

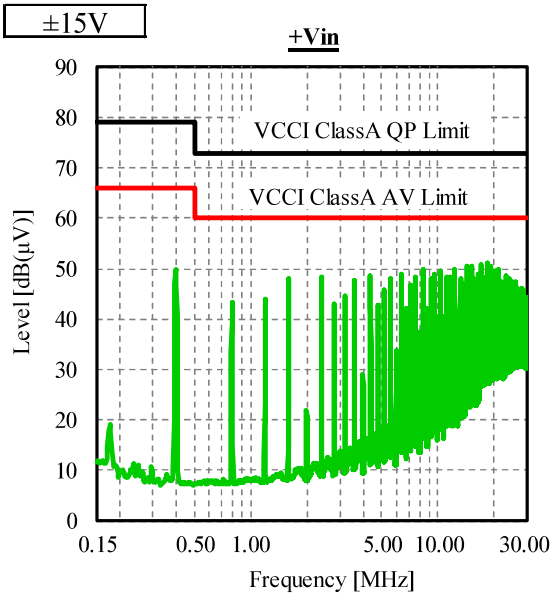
Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ℃

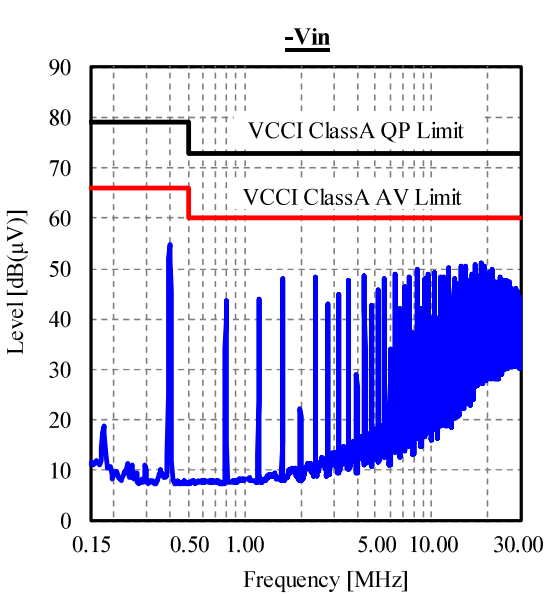
±12V





±15V





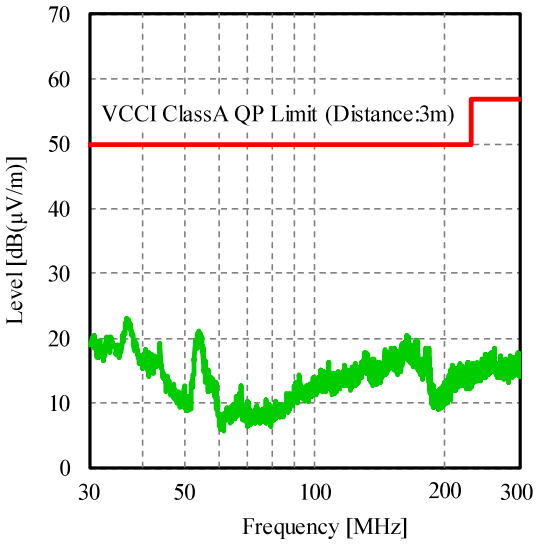
表示はQP値
Indication is QP values.

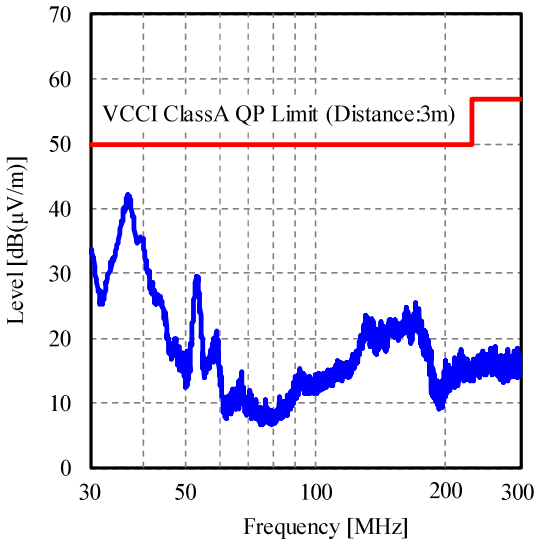
2-9. EMI特性 Electro-Magnetic Interference characteristics

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

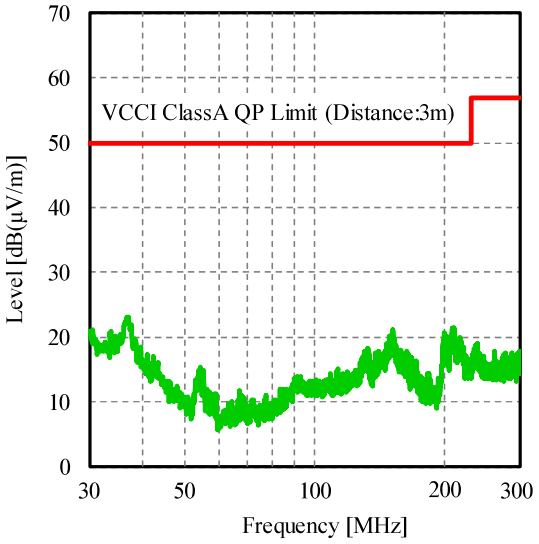
Conditions Vin : 48 VDC
Io : 100 %
Ta : 25 ℃

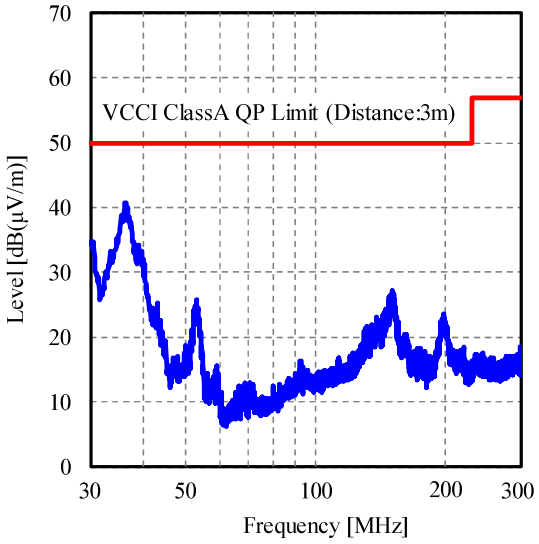
±12V





±15V





表示はピーク値
Indication is peak values.