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Material name : Evaluation data

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Customer's product name :

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TDK product name : DC-DC converter  
CC3-2412DS-E (SIP model)

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# ***TDK-Lambda***

**TDK Corporation**  
**Power Systems Business Group**

DWG.No.	TRSC-1586-1
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Issued 2006/12/01

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\* The measurement has been done without external output capacitor.  
(Except the output ripple noise measurement.)

(Product specification)

Product name	Input voltage(V)	Output voltage(V)	Output current(mA)	The maximum output power(W)	Ambient temperature(°C)
CC3-2412DS-E	18~36	±12 ±5%	0~125	3	-40 ~ +85 *2
		±15 ±5% *1	0~100		

\*1 TRM and -Vout are short-circuited.

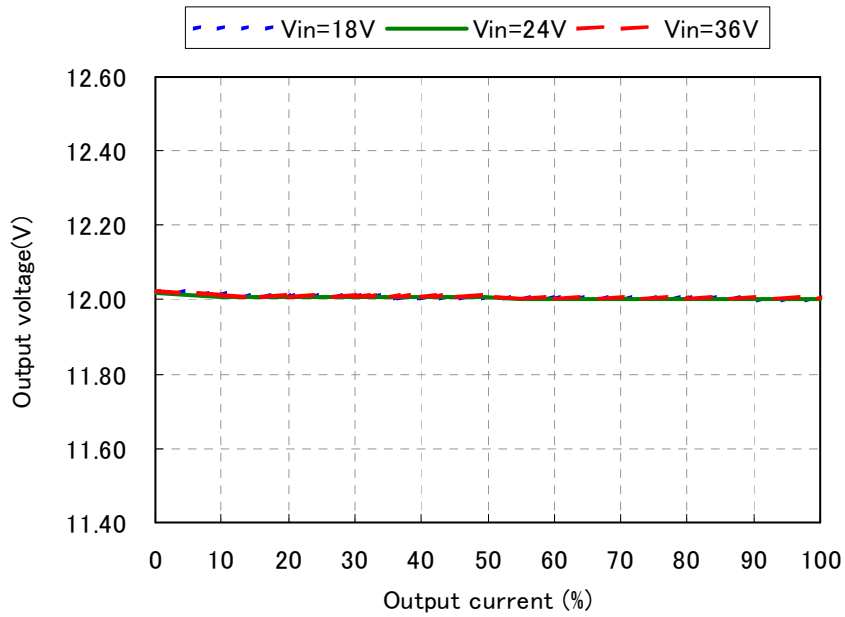
\*2 At 50°C or more, output power derating is necessary.

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	DC-DC converter CC3-2412DS-E		
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# 1. Load regulation

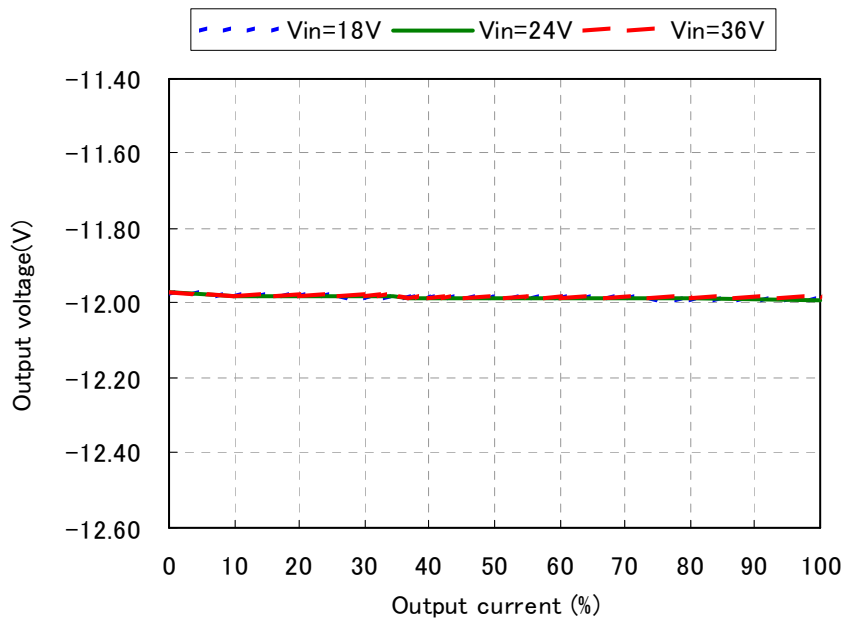
Condition Ta : -40°C

【 +Vout 】



Condition Ta : -40°C

【 -Vout 】



Product name or model, title

DC-DC converter CC3-2412DS-E

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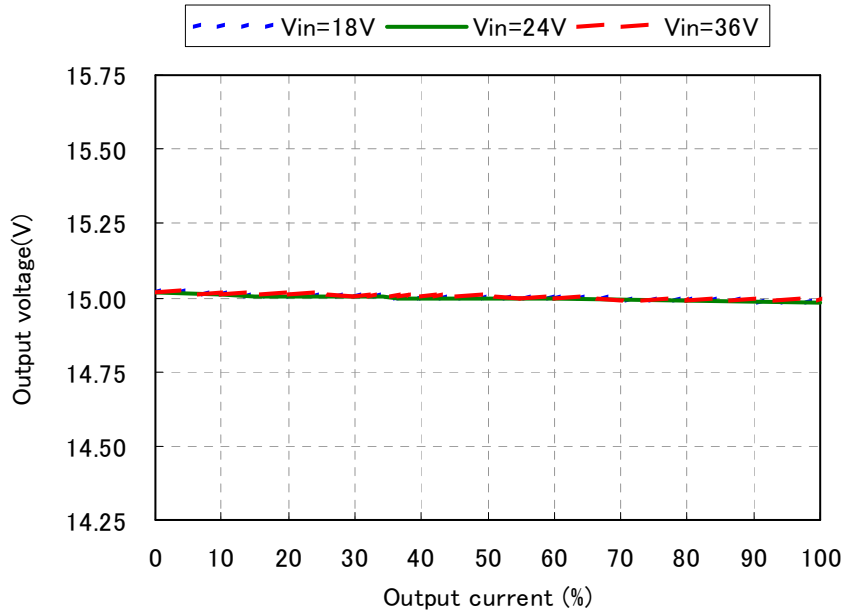
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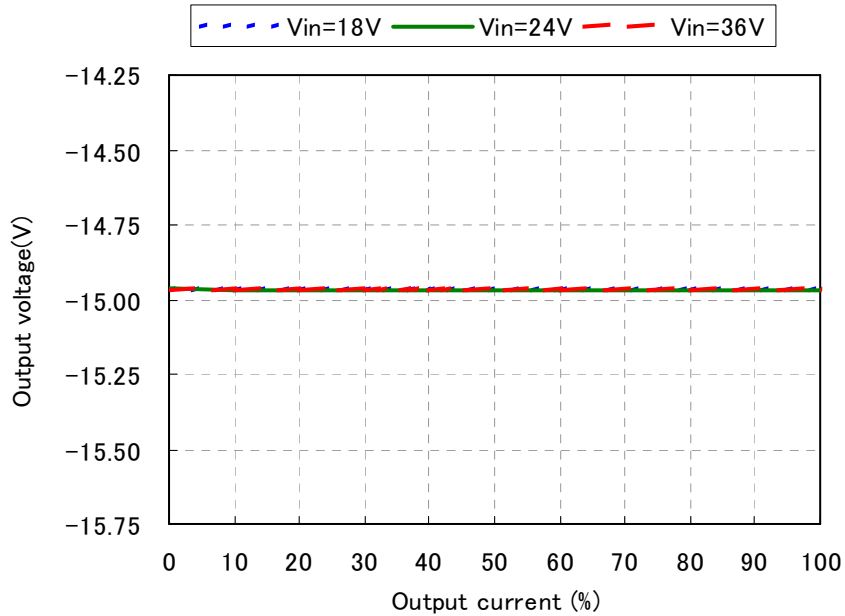
Condition Ta : -40°C  
TRM: Short-circuited to -Vout.

【 +Vout 】



Condition Ta : -40°C  
TRM: Short-circuited to -Vout.

【 -Vout 】



Product name or model, title

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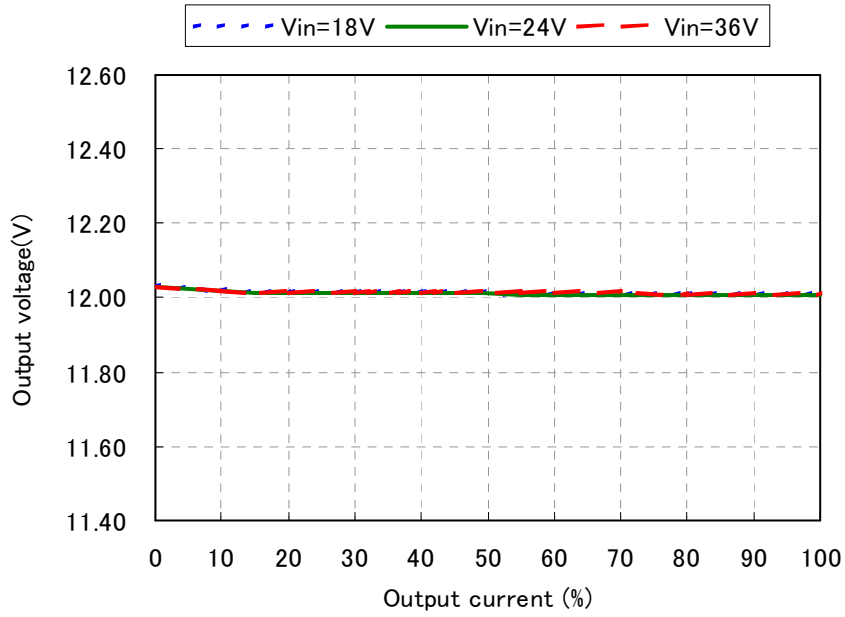
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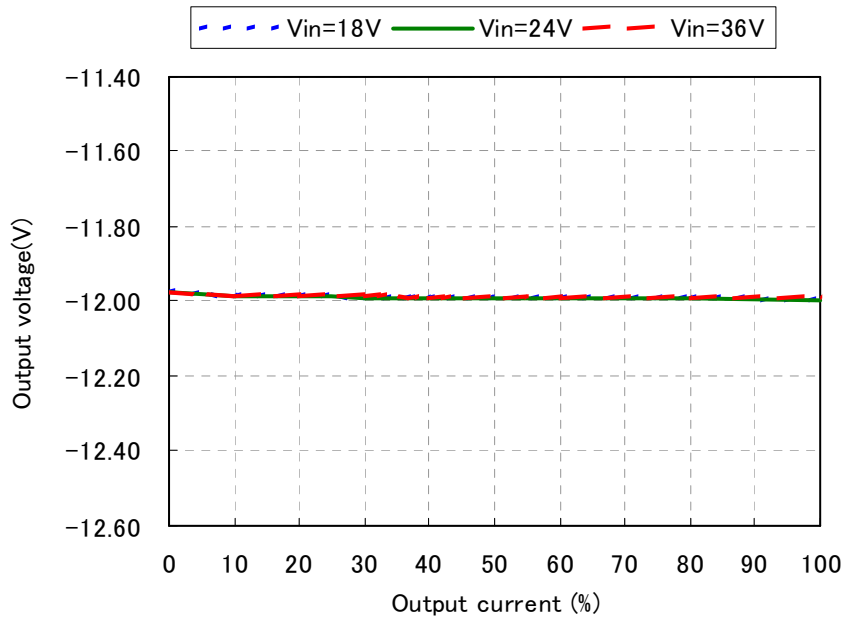
Condition Ta : 25°C

【 +Vout 】



Condition Ta : 25°C

【 -Vout 】



Product name or model, title

DC-DC converter CC3-2412DS-E

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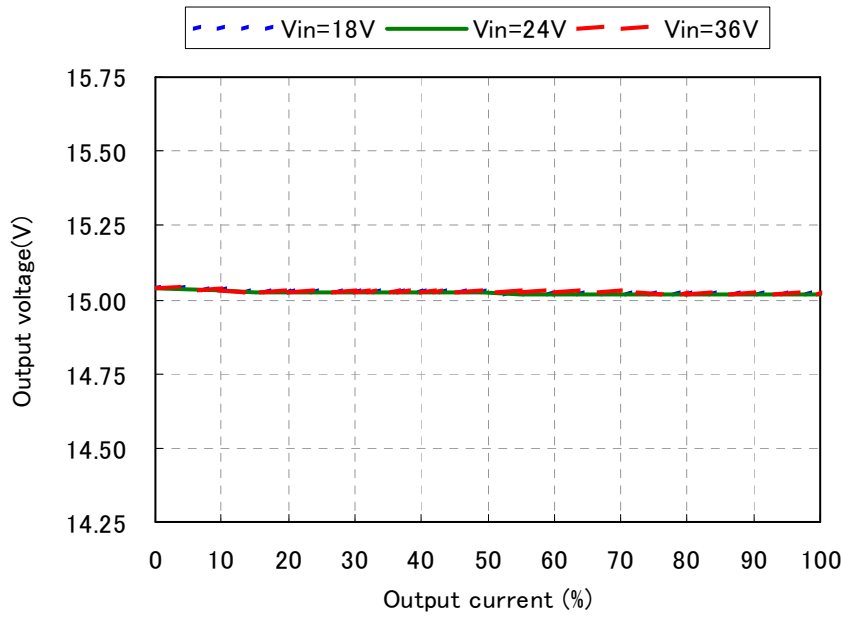
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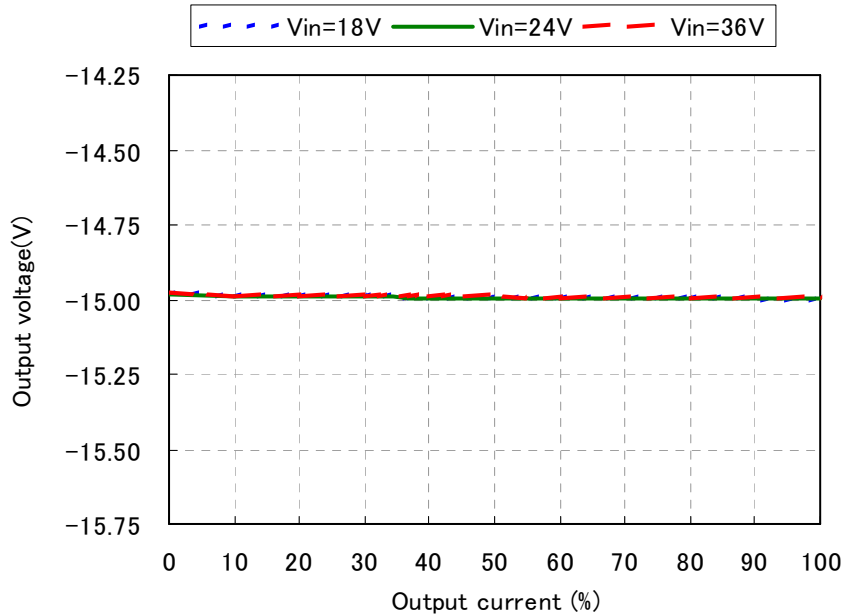
Condition Ta : 25°C  
TRM: Short-circuited to -Vout.

【 +Vout 】



Condition Ta : 25°C  
TRM: Short-circuited to -Vout.

【 -Vout 】



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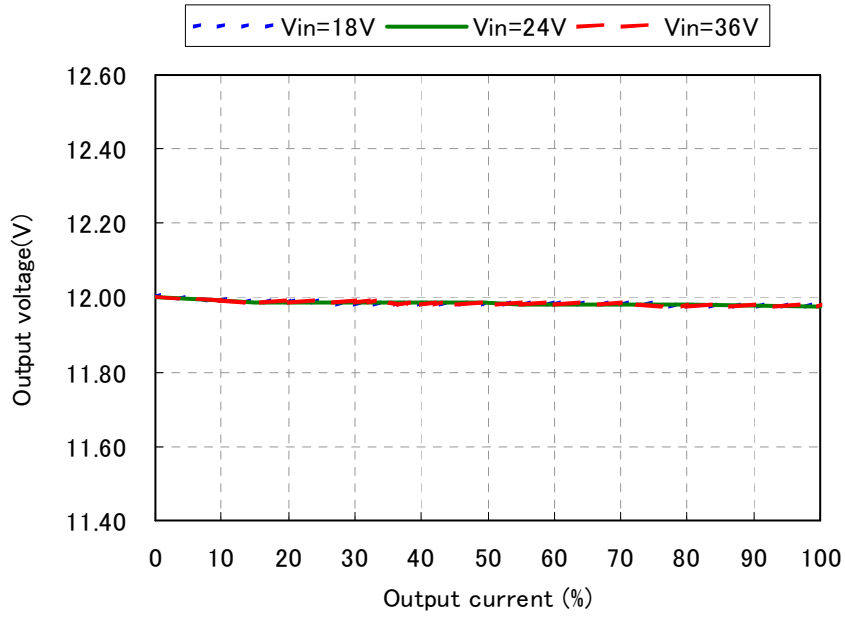
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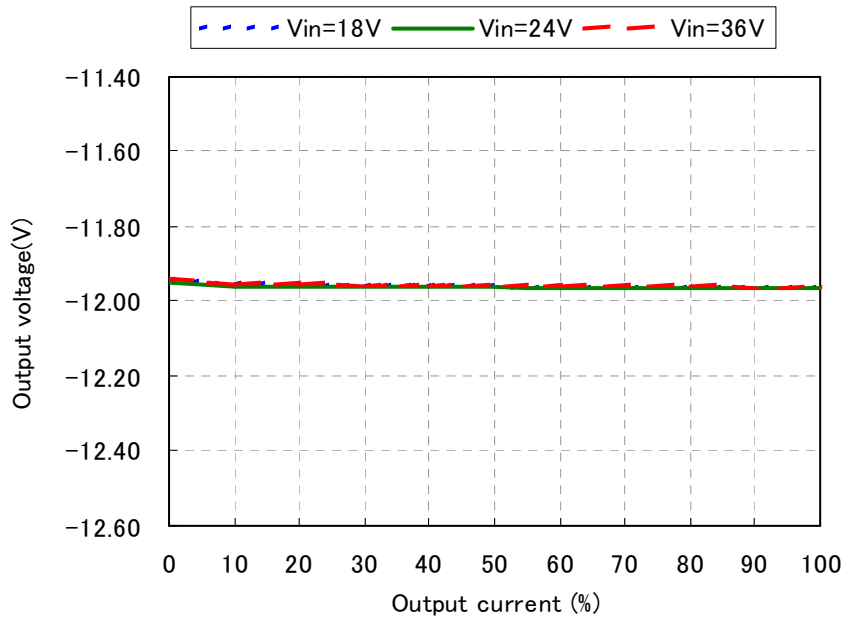
Condition Ta : 85°C

【 +Vout 】



Condition Ta : 85°C

【 -Vout 】



Product name or model, title

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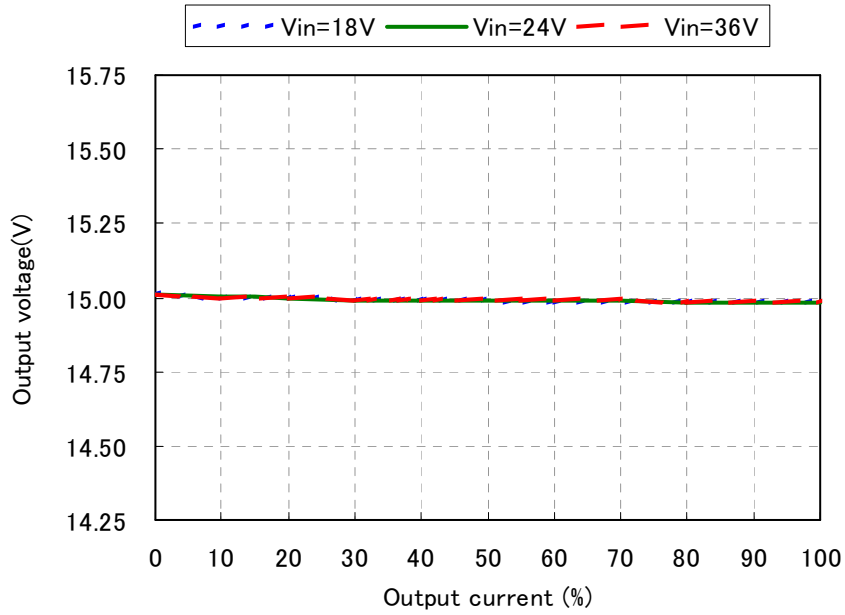
Evaluation data

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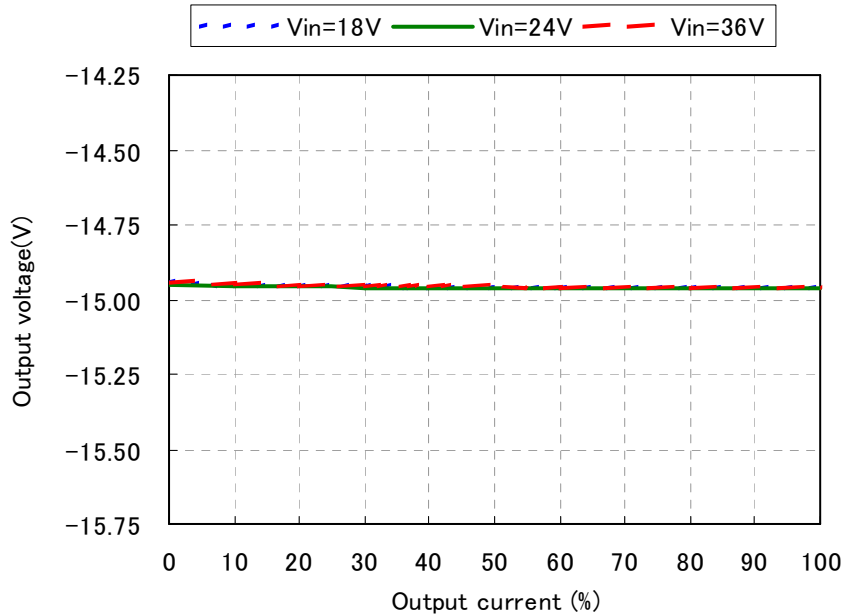
Condition Ta : 85°C  
TRM: Short-circuited to -Vout.

【 +Vout 】



Condition Ta : 85°C  
TRM: Short-circuited to -Vout.

【 -Vout 】



Product name or model, title

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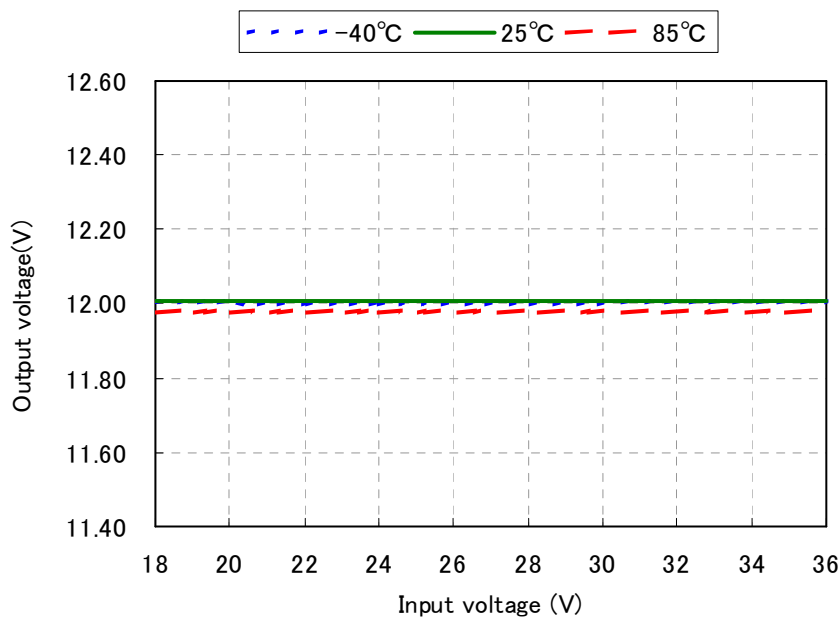
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## 2. Line regulation

Condition

Iout : 100%

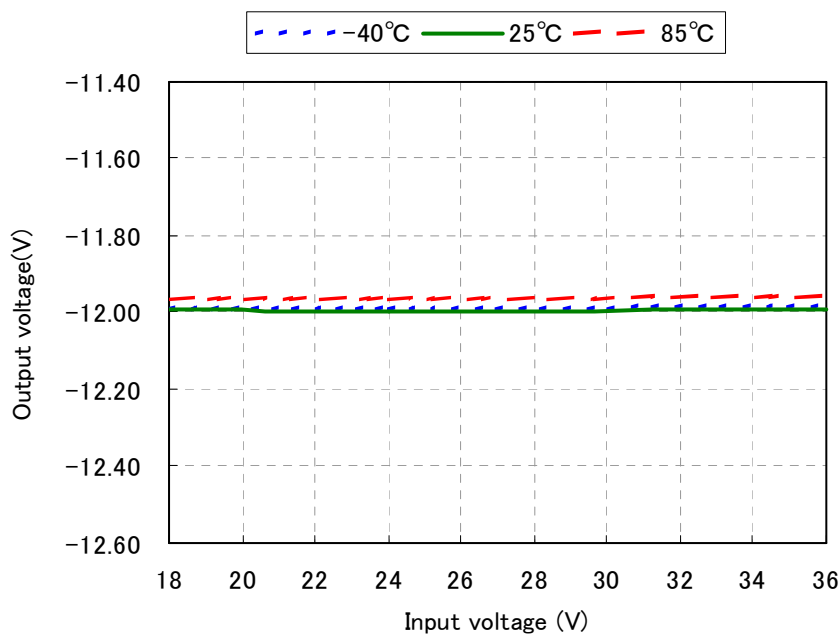
【 +Vout 】



Condition

Iout : 100%

【 -Vout 】



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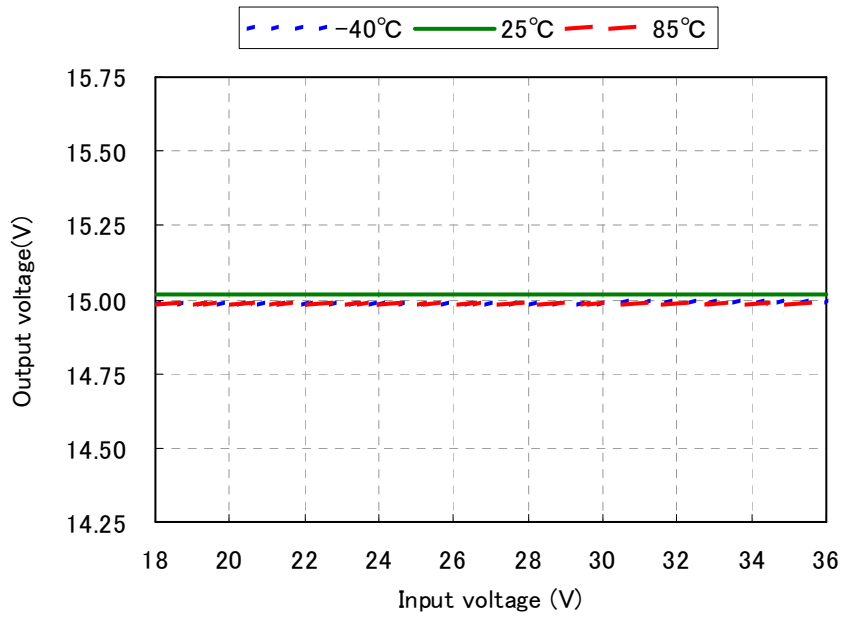
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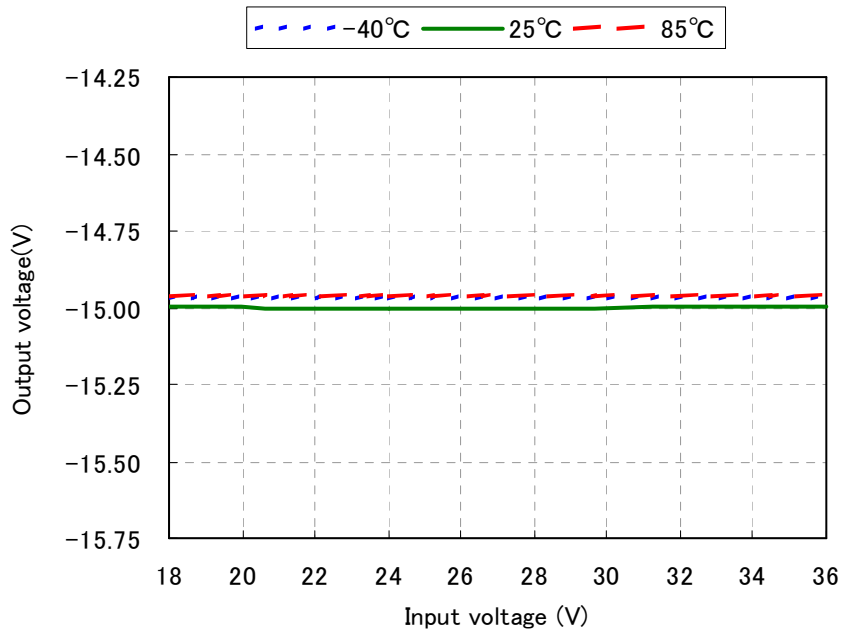
Condition Iout : 100%  
TRM: Short-circuited to -Vout.

【 +Vout 】



Condition Iout : 100%  
TRM: Short-circuited to -Vout.

【 -Vout 】

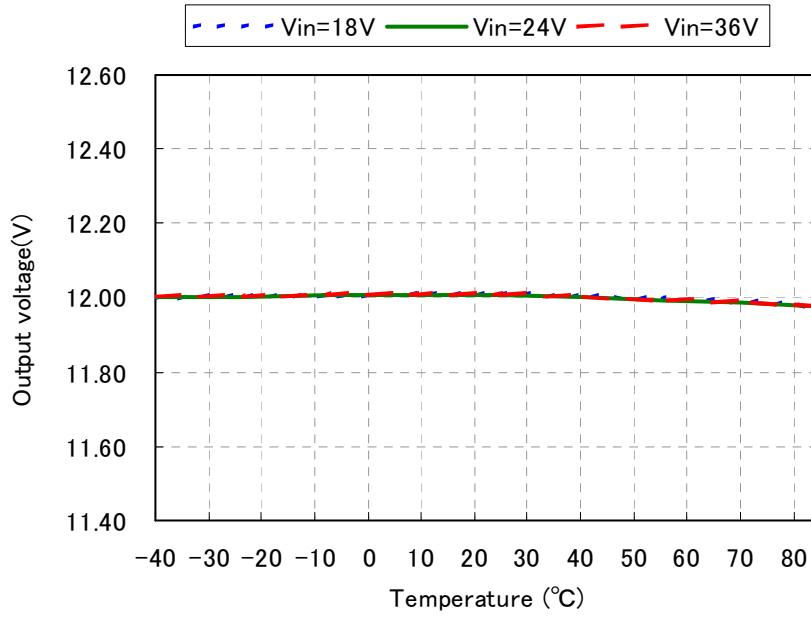


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DC-DC converter CC3-2412DS-E			
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### 3. Temperature regulation

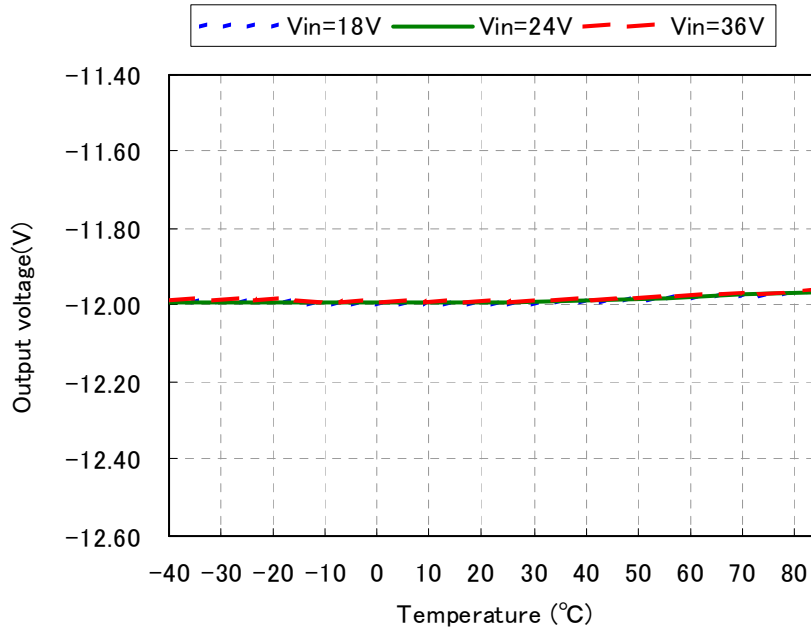
Condition      Iout : 100%

【 +Vout 】



Condition      Iout : 100%

【 -Vout 】



Product name or model, title

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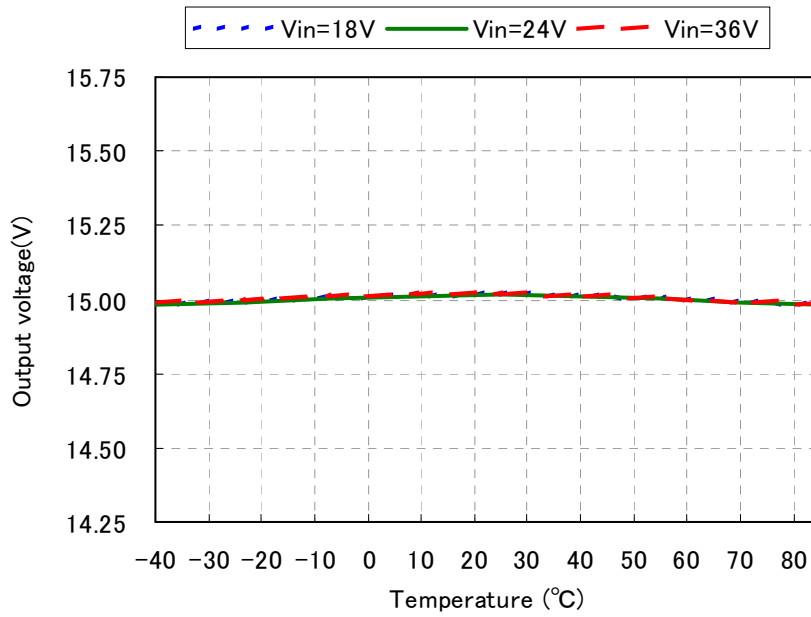
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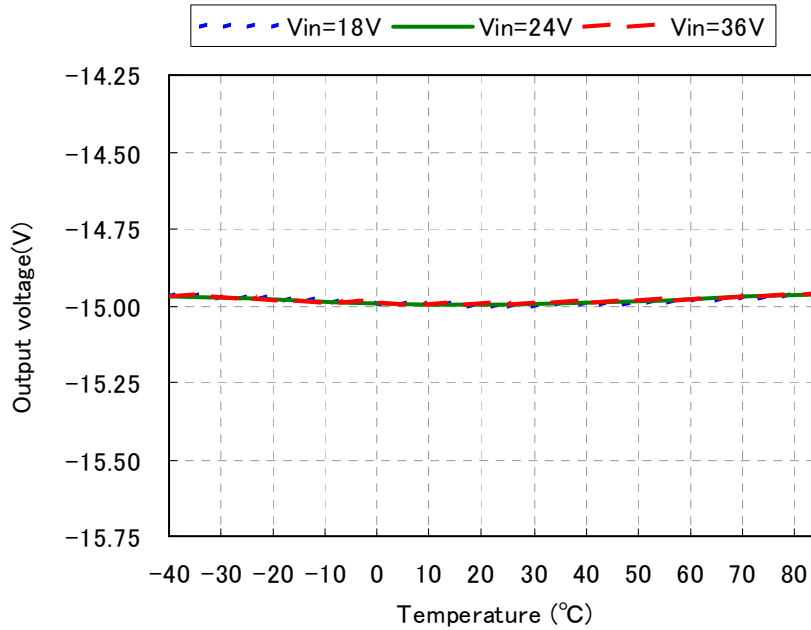
Condition Iout : 100%  
TRM: Short-circuited to -Vout.

【 +Vout 】



Condition Iout : 100%  
TRM: Short-circuited to -Vout.

【 -Vout 】



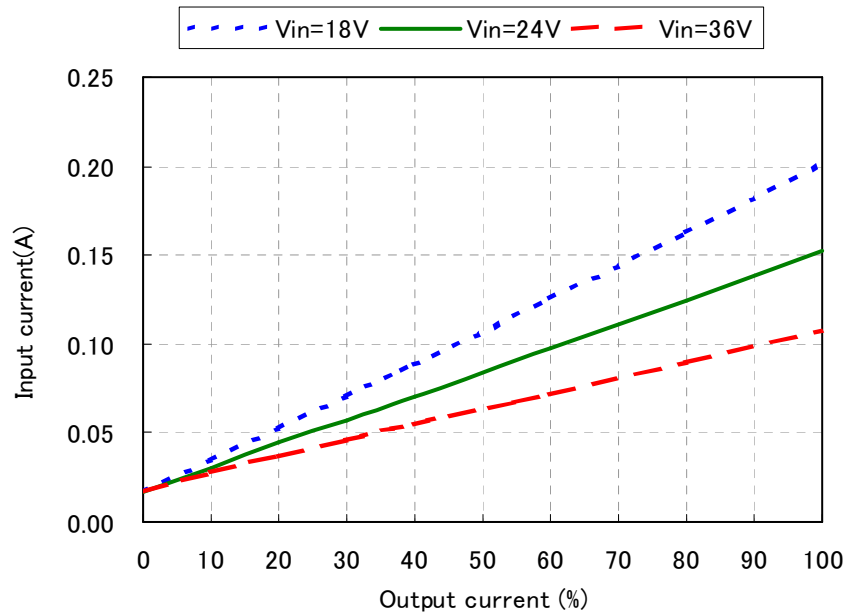
Product name or model, title			
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## 4. Input current(vs. load current)

Condition

Ta : 25°C

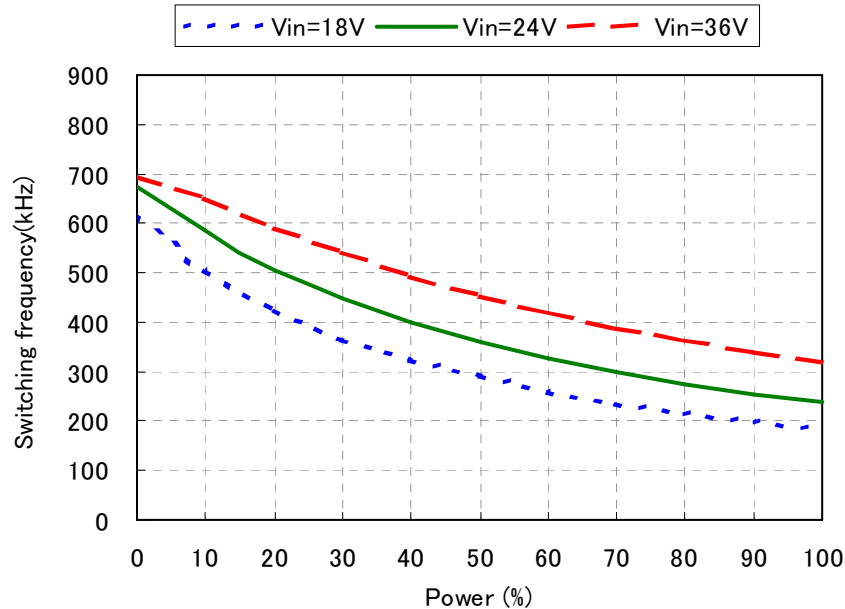
Vout : ±12V



## 5. Switching frequency(vs. output power)

Condition

Ta : 25°C



Product name or model, title

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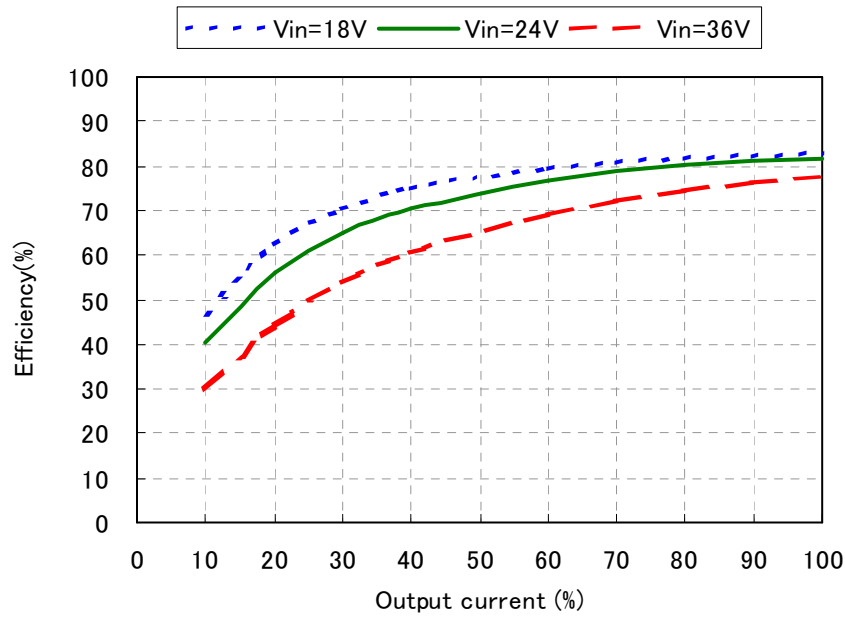
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## 6. Efficiency(vs. load current)

Condition

Ta : 25°C

Vout : ±12V

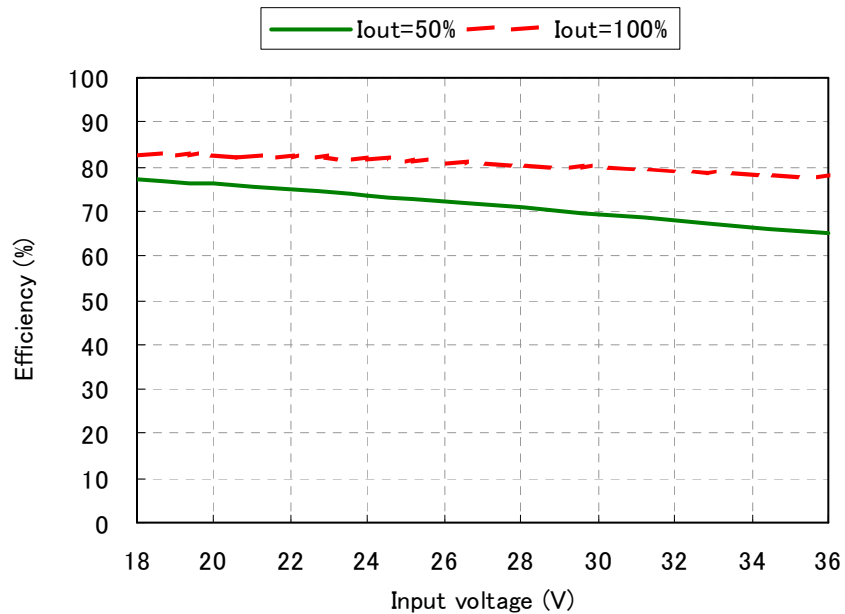


## 7. Efficiency(vs. input voltage)

Condition

Ta : 25°C

Vout : ±12V



Product name or model, title

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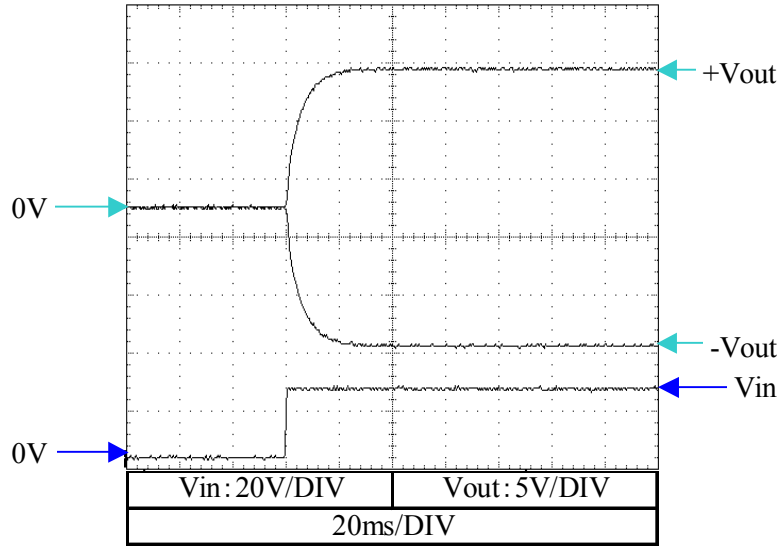
# 8. Output rise characteristics

Condition

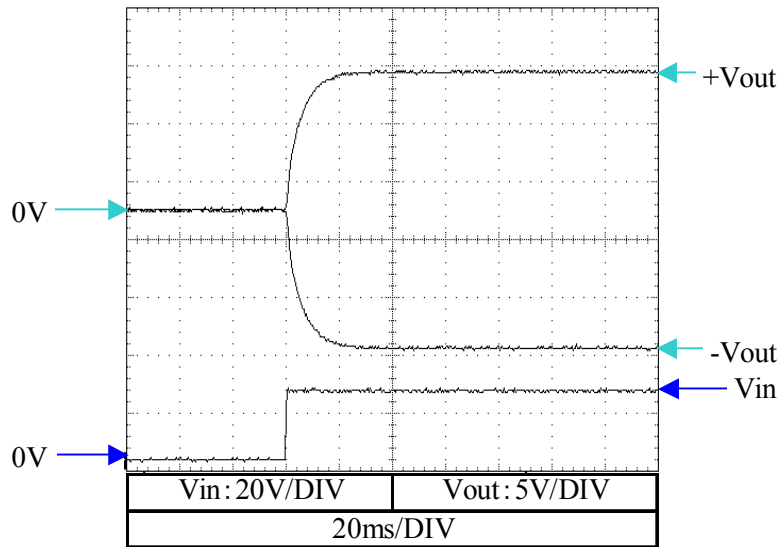
Vin : 24V

Ta : 25°C

Iout : 0%



Iout : 100%



Product name or model, title

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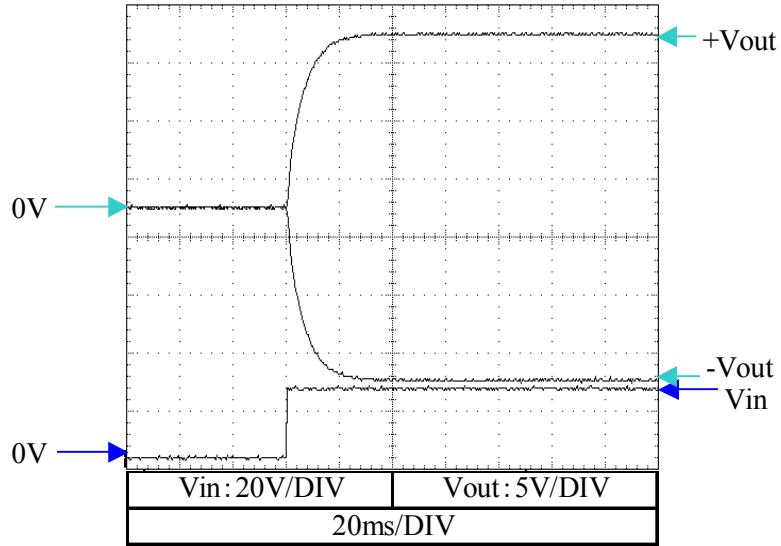
Evaluation data

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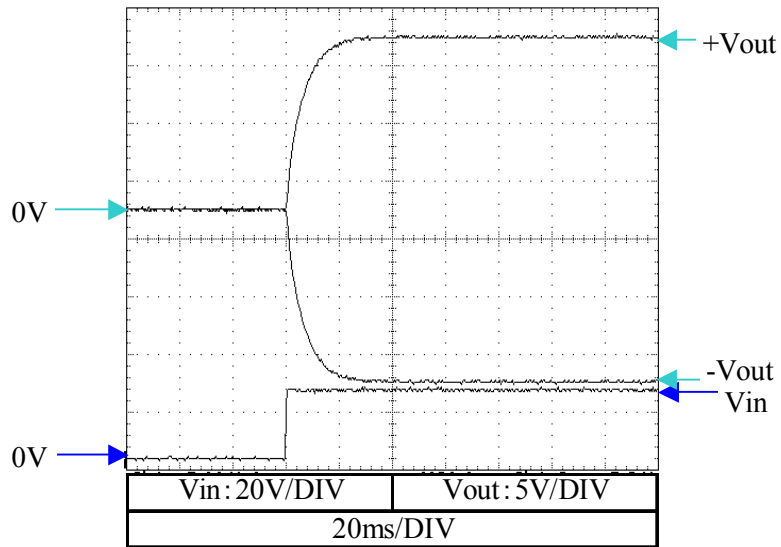
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Condition Vin : 24V  
 Ta : 25°C  
 TRM: Short-circuited to -Vout.

Iout : 0%



Iout : 100%



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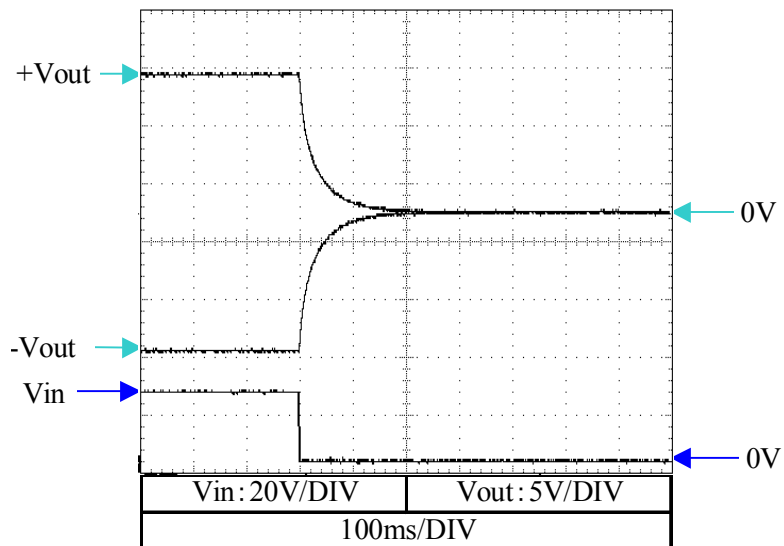
# 9. Output fall characteristics

Condition

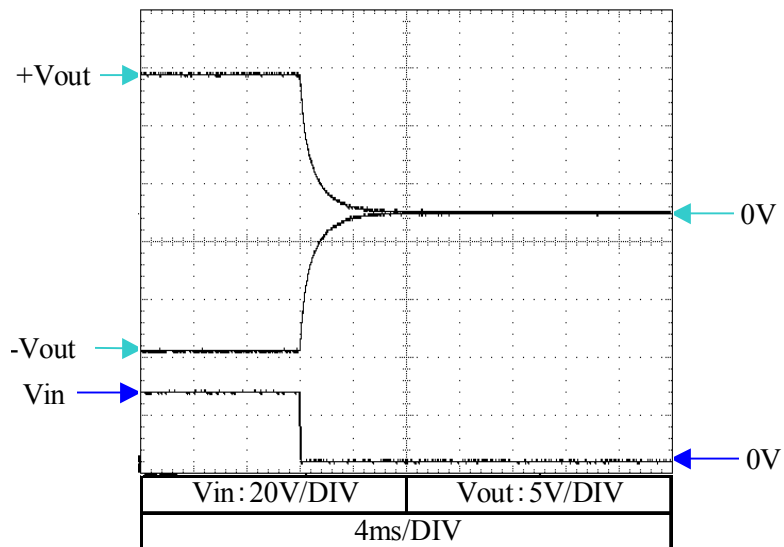
Vin : 24V

Ta : 25°C

Iout : 0%



Iout : 100%



Product name or model, title

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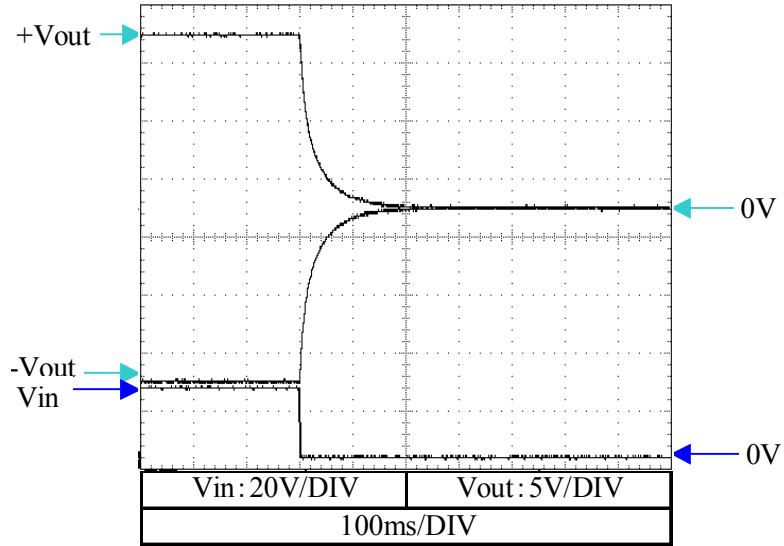
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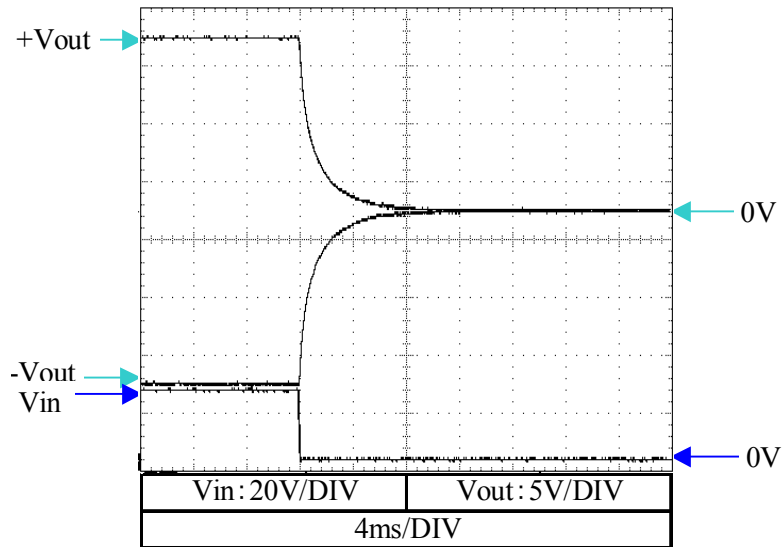
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Condition Vin : 24V  
 Ta : 25°C  
 TRM: Short-circuited to -Vout.

Iout : 0%



Iout : 100%



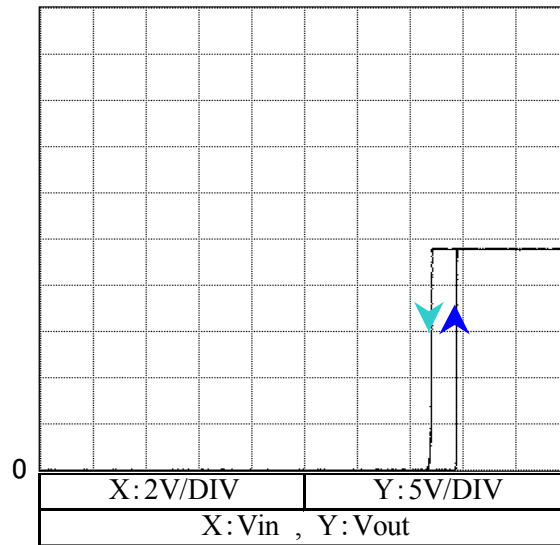
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## 10. Start/stop input voltage characteristics

Condition

$I_{out}$  : 100%

$T_a$  : 25°C



## 11. Dynamic load response characteristics

Condition

$V_{in}$  : 24V

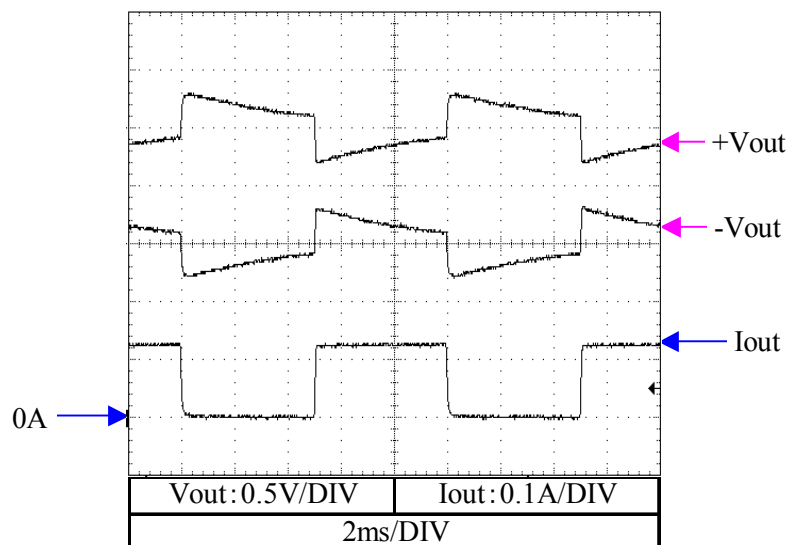
$V_{out}$  :  $\pm 12V$

$I_{out}$  : 0% ~ 100%

$T_r=T_f$  : 100us

$f$  : 100Hz

$T_a$  : 25°C



Product name or model, title

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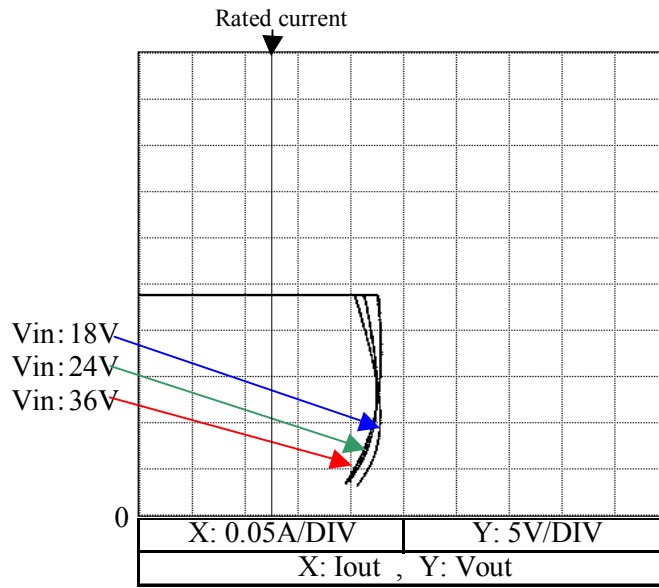
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# 12. Over current protection characteristics

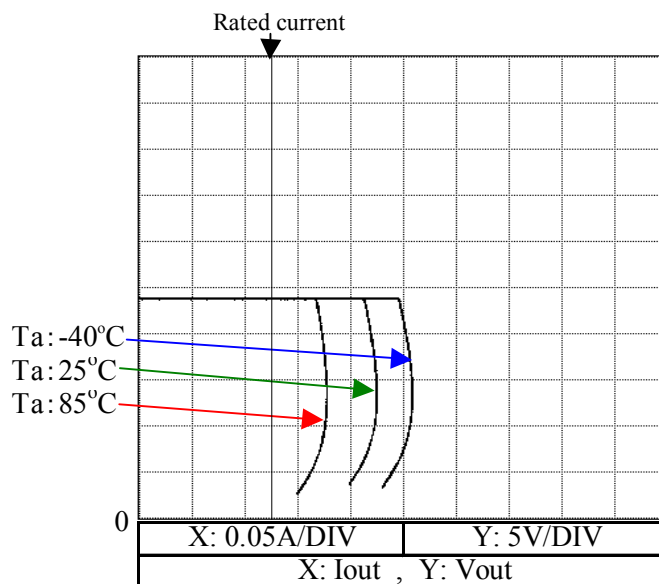
Condition

Ta : 25°C



Condition

Vin : 24V



Product name or model, title

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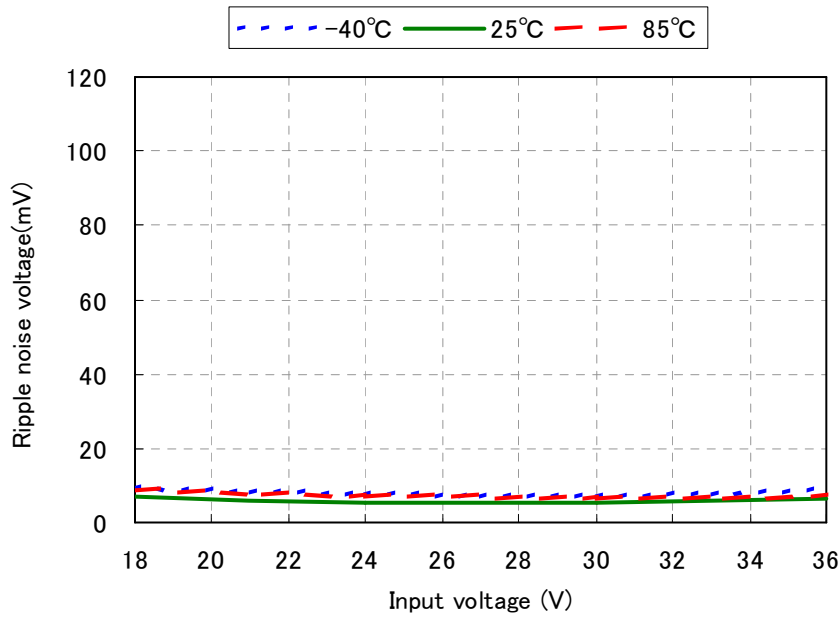
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# 13. Output ripple and noise characteristics

Condition

lout : 100%

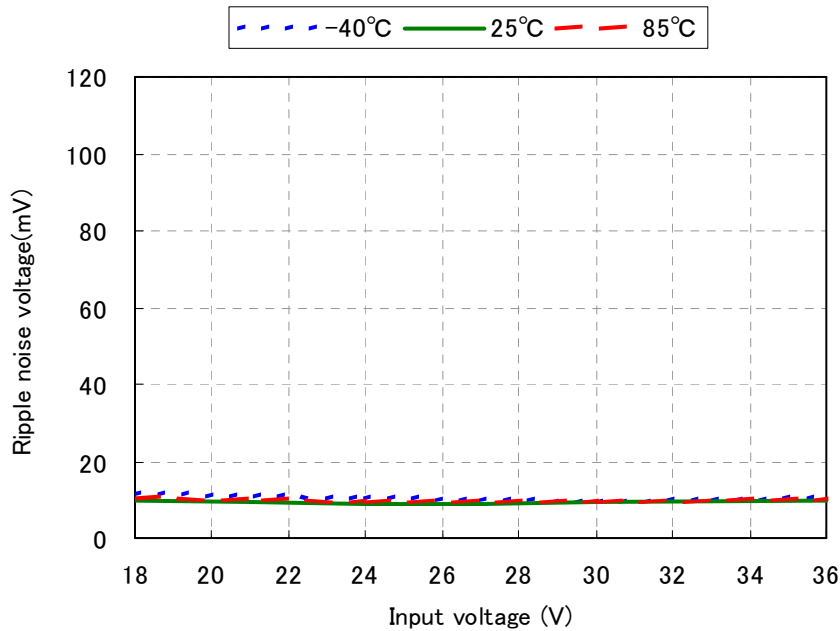
【 +Vout 】



Condition

lout : 100%

【 -Vout 】



Product name or model, title

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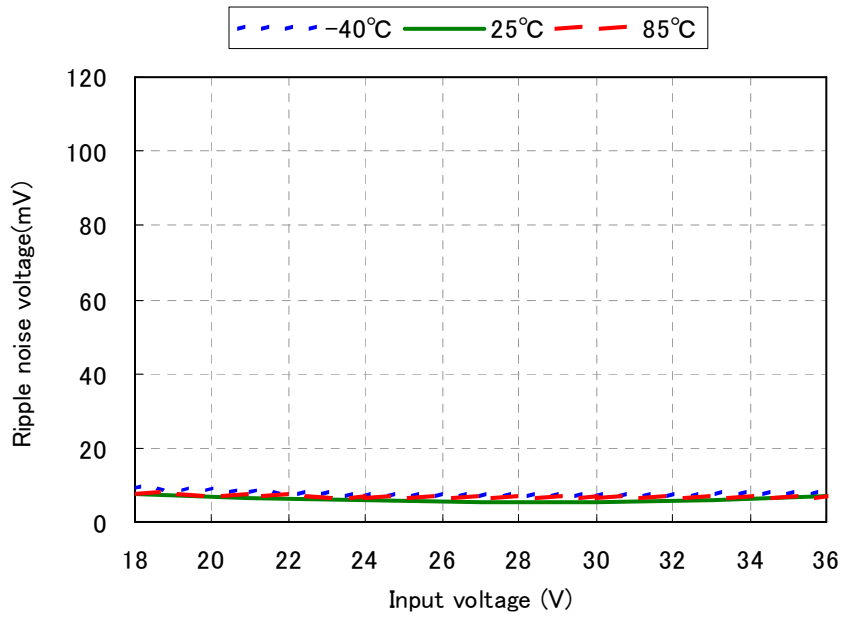
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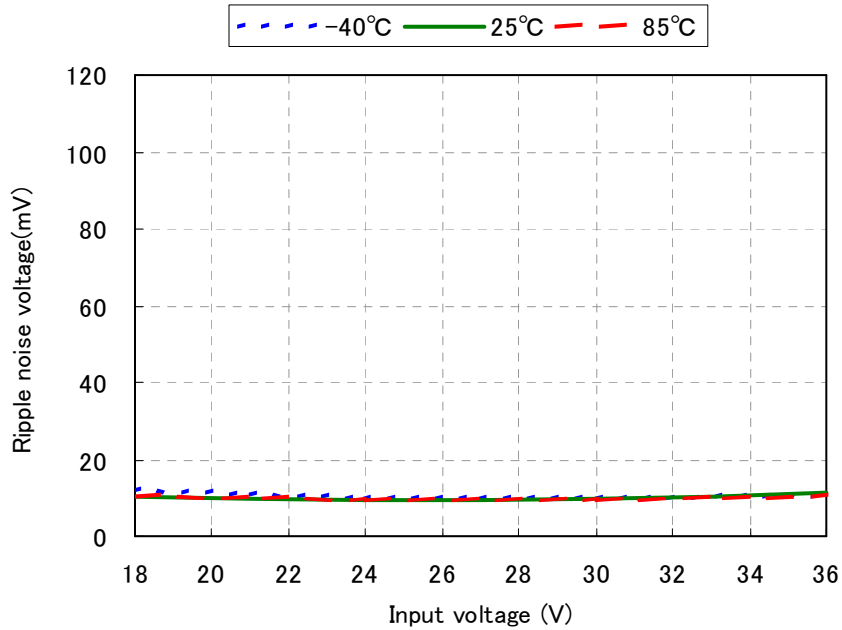
Condition Iout : 100%  
TRM: Short-circuited to -Vout.

【 +Vout 】



Condition Iout : 100%  
TRM: Short-circuited to -Vout.

【 -Vout 】



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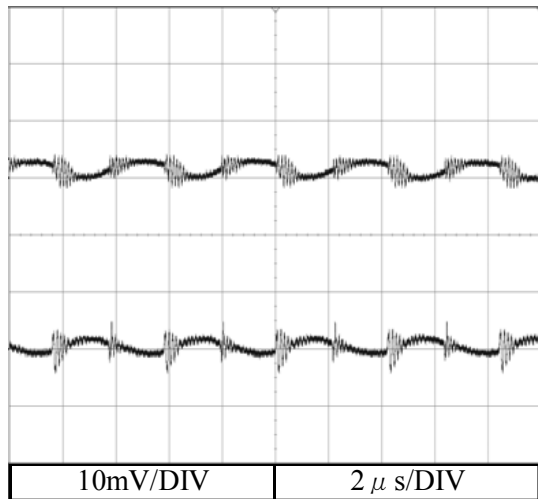
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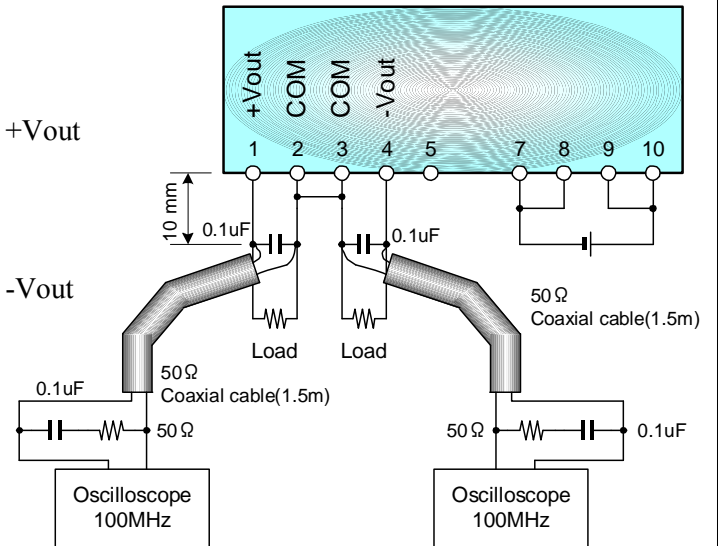
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## 14. Output ripple and noise waveform

Condition Vin : 24V  
Iout : 100%  
Ta : 25°C

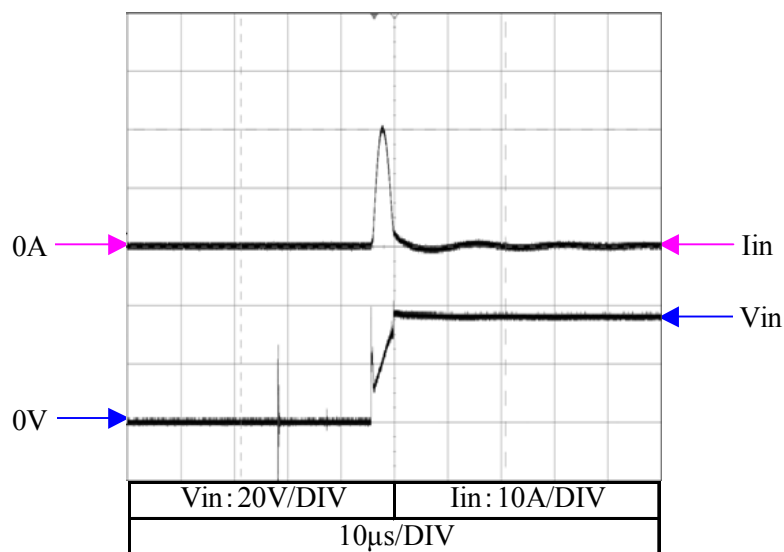


(Measurement circuit)



## 15. Inrush current waveform

Condition Vin : 36V  
Iout : 100%  
Ta : 25°C



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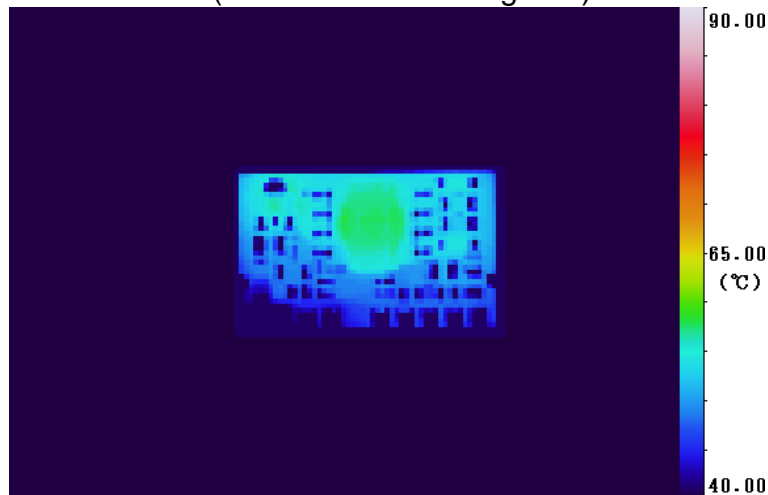
# 16. Temperature distribution

(Thermography)

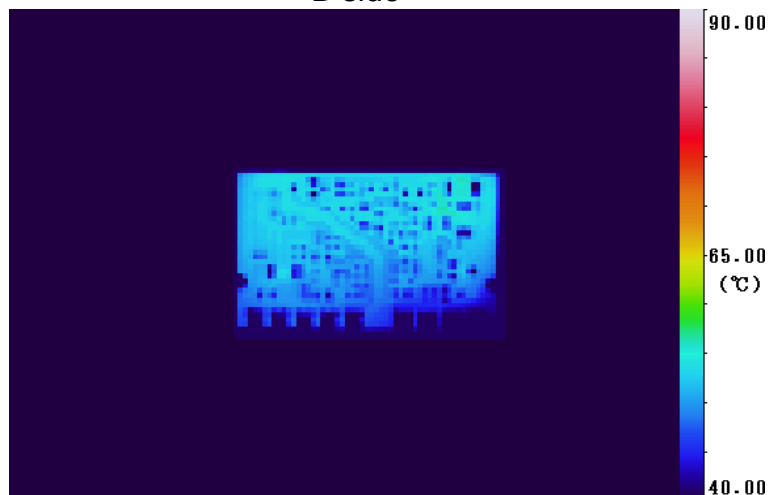
Condition

Vin : 24V  
 Vout : ±12V  
 Iout : 100%  
 Ta : 25°C  
 Wind velocity : 0m/s

A side(transformer mounting side)



B side



(Main parts)

rise of temperature( $\Delta T$ )		
Main swtch(°C)	Rectifier diode(°C)	Transformer(°C)
29.8	26.3	27.9

\* We measured the temperatures of part s without the case by using the thermography. Therefore, it might be different a little from the actual temperature.

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