ON Semiconductor®

Test Procedure for the STK681-310GEVB Evaluation Board

Evaluation Board Setup

[Supply Voltage] Vcc1 (10 to 42V): Power Supply for DC motor
Vcc2 (5V) : Power Supply for internal logic IC

[Operation Guide]

1. Motor Connection:
   Connect the motor to OUT1 and OUT2.

2. Initial Condition Setting:
   Set to signal condition IN1=H, IN2=H, and INH=L.

3. Power Supply:
   At first, supply DC voltage to Vcc2(5.0V).
   Next, supply DC voltage to Vcc1.

4. Set to Forward or Reverse signal condition with INH=Low.
   Turn “High” INH signal.
   Output current flows between OUT1 and OUT2.

5. Motor Operation

[Setting the current limit using the Vref pin]

Without external resistance R3, output current is limited to Iomax.

You can limit to below Iomax by installing R3.
As for Iomax of STK681-310, 0.42V is generated with 5V, internal resistance 82k (R1) and 7.5k (R2), then Iomax=4.2A is designed by comparing with internal current sensing resistor Rs.

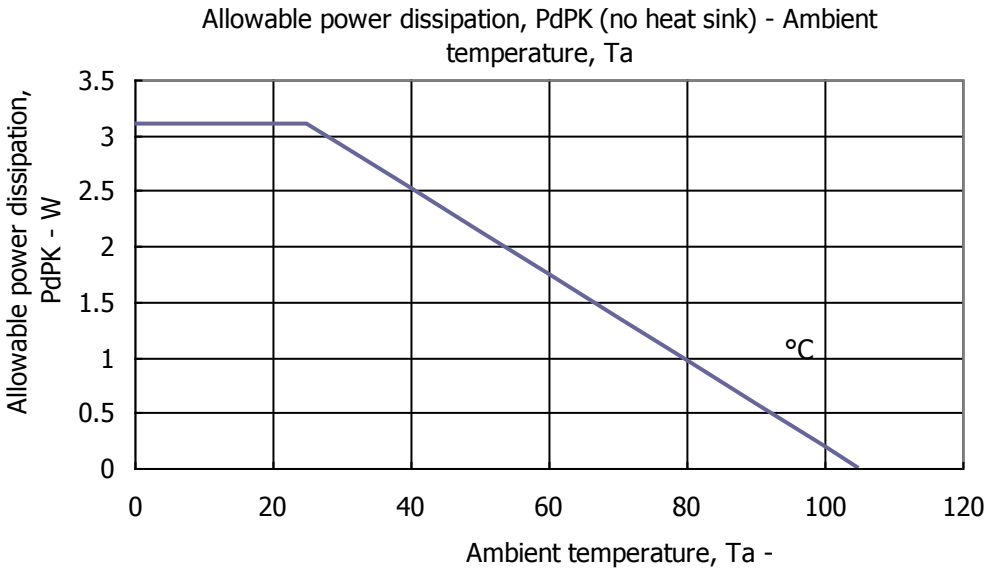
In case of without external resistance R3
Iomax=(Vcc2×R2/(R1+R2))÷Rs

	R1	R2	Rs
STK681-300	82kΩ	5.1kΩ	0.1Ω
STK681-310	82kΩ	7.5kΩ	0.1Ω
STK681-320	82kΩ	5.1kΩ	0.056Ω

Including external resistance R3
Io= ((Vcc2×(R2×R3)/(R2+R3))/(R1+(R2×R3)/(R2+R3)))÷Rs

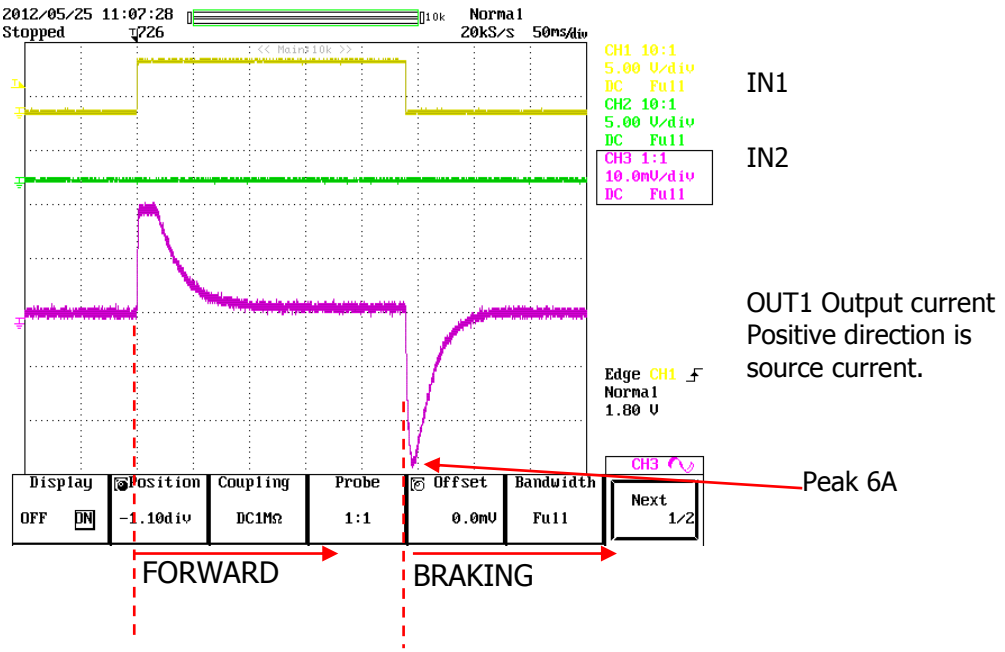
If you mount external resistor R3=7.5k, for instance, you can limit to 2.1A, which is half of Iomax (4.2A) of STK681-310.

Allowable power dissipation (Reference value)

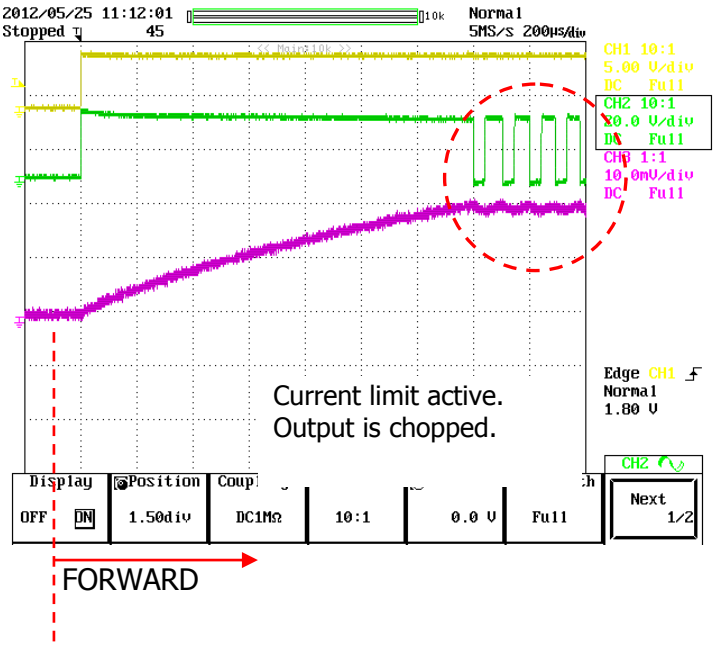


Waveform example

STK681-310(Current limit 4.2A setting)
IN1 and IN2; 5V/div, Output current; 2A/div



STK681-310(Current limit 2A setting)
IN1 5V/div, OUT1 20V/div, Output current; 2A/div



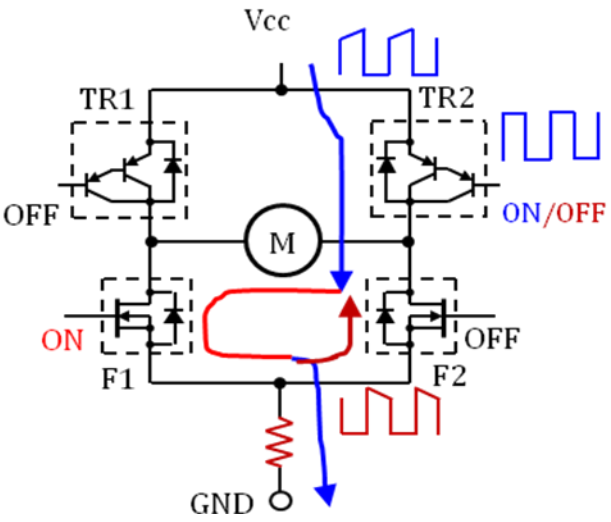
IN1

OUT1

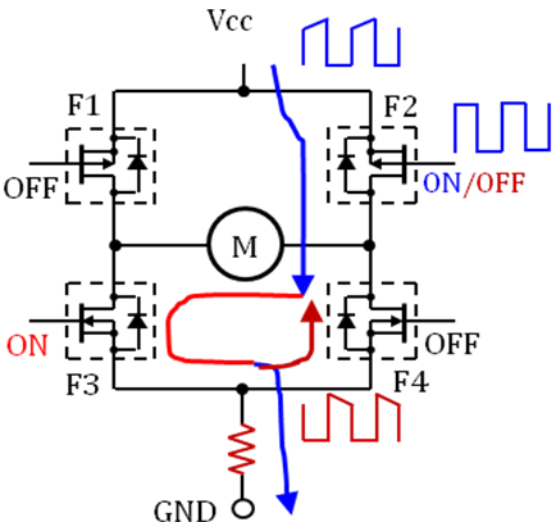
OUT1 Output current
Positive direction is
source current.

Current control is slow decay.
STK681-300, 310 and 320 control Bipolar Transistor or MOSFET at High side by constant-current PWM control system.
Current control enters Slow decay mode.

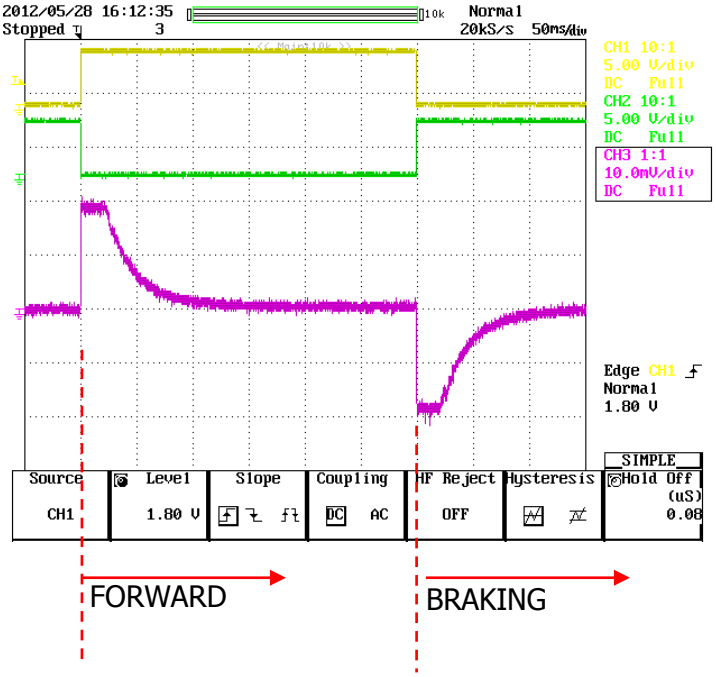
STK681-300, 310



STK681-320



STK681-310(Current limit 4.2A setting)
IN1 and IN2; 5V/div, Output current; 2A/div



IN1

IN2

OUT1 Output current
Positive direction is
source current.