



## 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 I<sub>max</sub>.

You can limit to below I<sub>max</sub> by installing R3.

As for I<sub>max</sub> of STK681-310, 0.42V is generated with 5V, internal resistance 82k (R1) and 7.5k (R2), then I<sub>max</sub>=4.2A is designed by comparing with internal current sensing resistor R<sub>s</sub>.

In case of without external resistance R3

$$I_{\max} = (V_{cc2} \times R2 / (R1 + R2)) \div R_s$$

	R1	R2	R <sub>s</sub>
STK681-300	82kΩ	5.1kΩ	0.1Ω
STK681-310	82kΩ	7.5kΩ	0.1Ω
STK681-320	82kΩ	5.1kΩ	0.056Ω

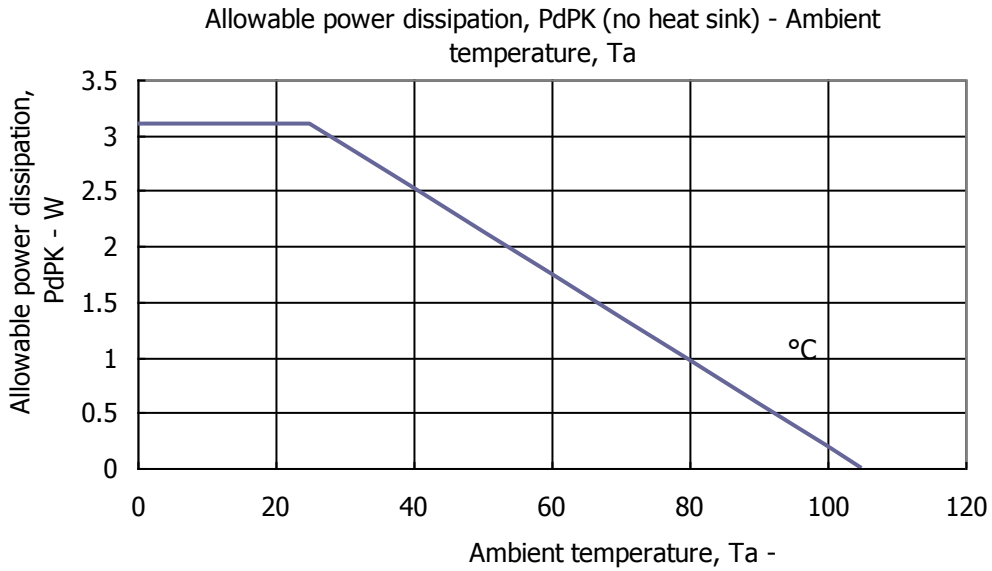
Including external resistance R3

$$I_o = ((V_{cc2} \times (R2 \times R3) / (R2 + R3)) / (R1 + (R2 \times R3) / (R2 + R3))) \div R_s$$

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

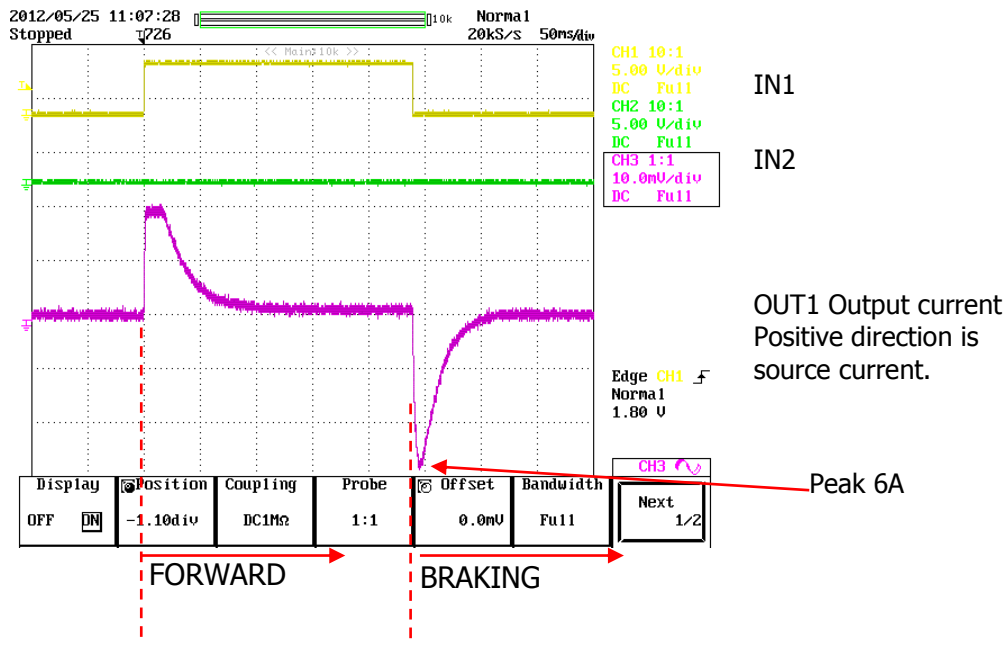


**Allowable power dissipation (Reference value)**



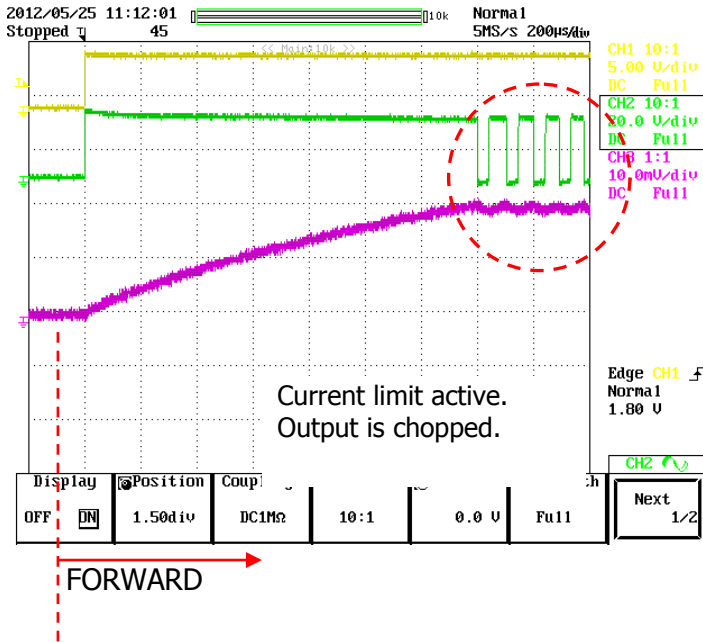
**Waveform example**

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

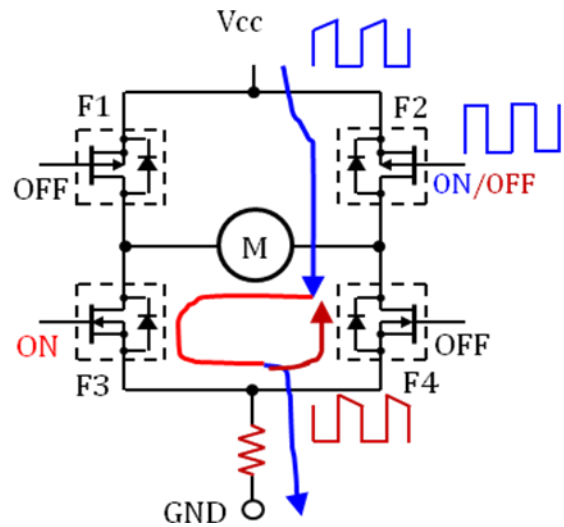
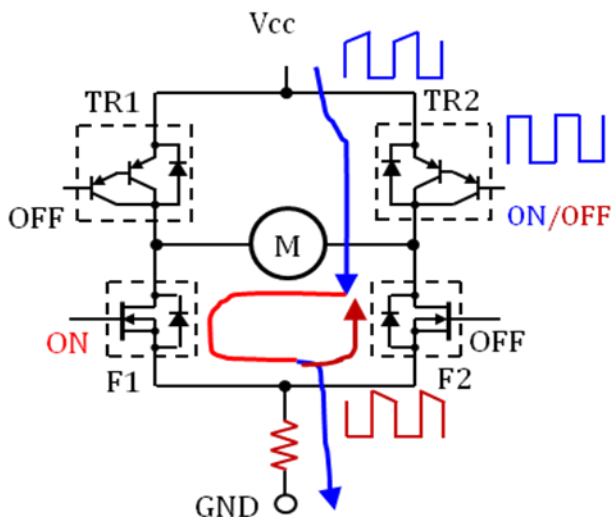
OUT1

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.

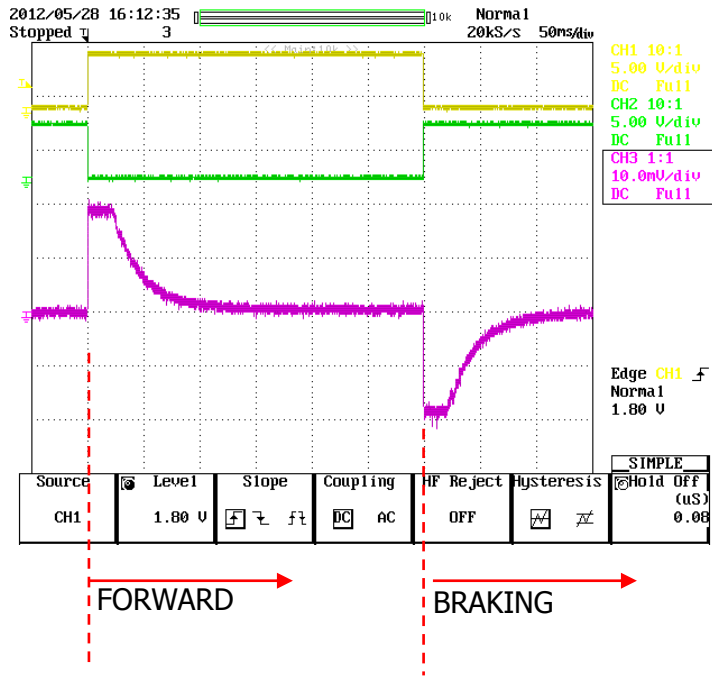
STK681-300, 310

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.