



## Test Procedure for the STK681-320GEVB 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         |

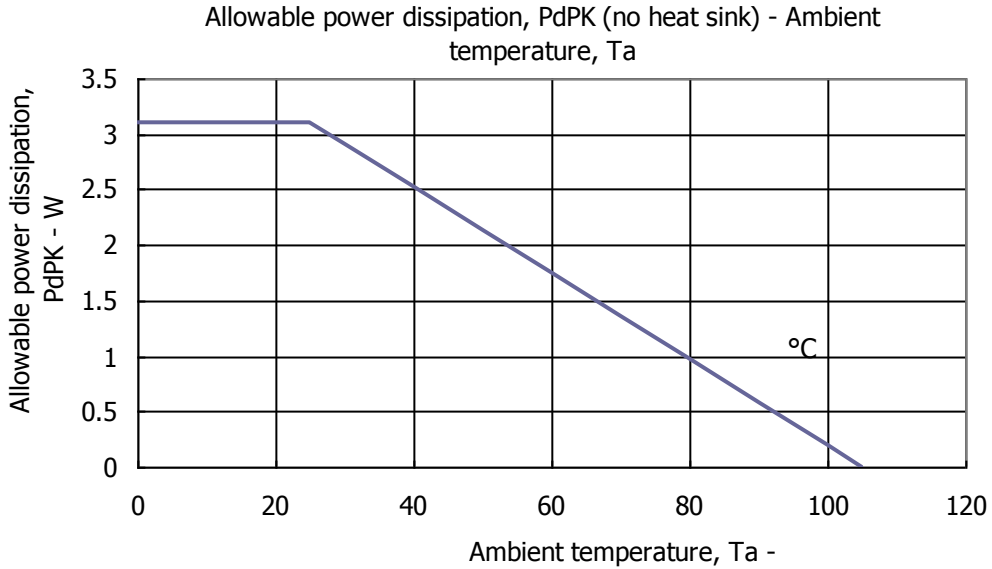
Including external resistance R3

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

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.

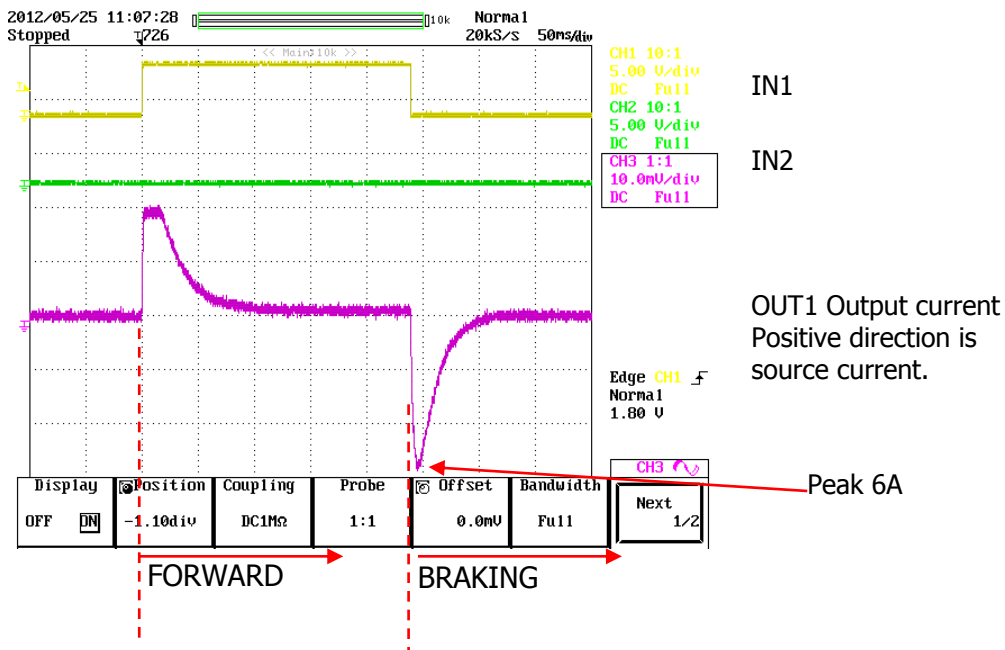


Allowable power dissipation (Reference value)



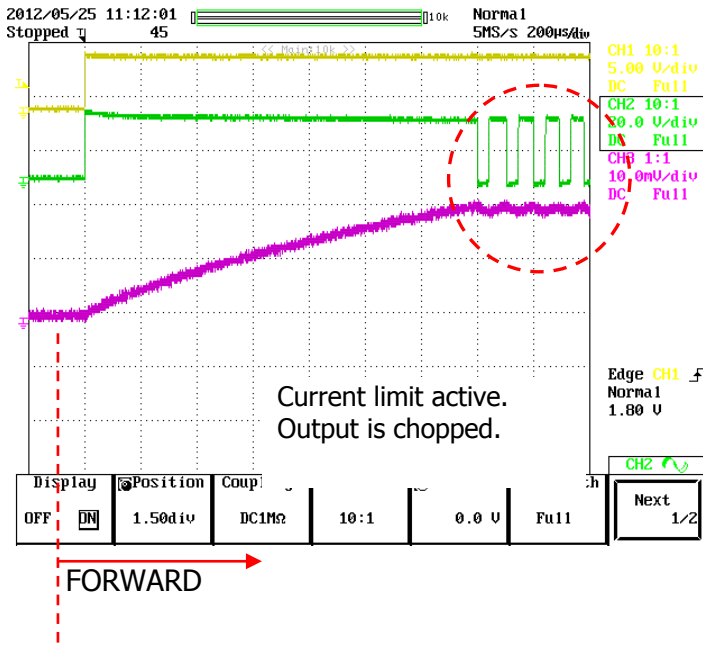
Waveform example

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.

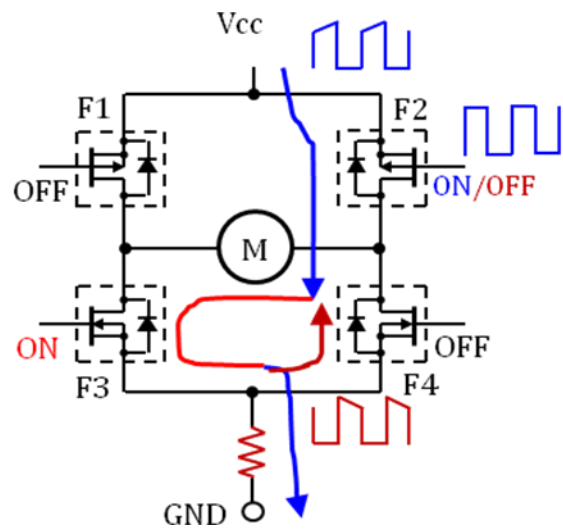
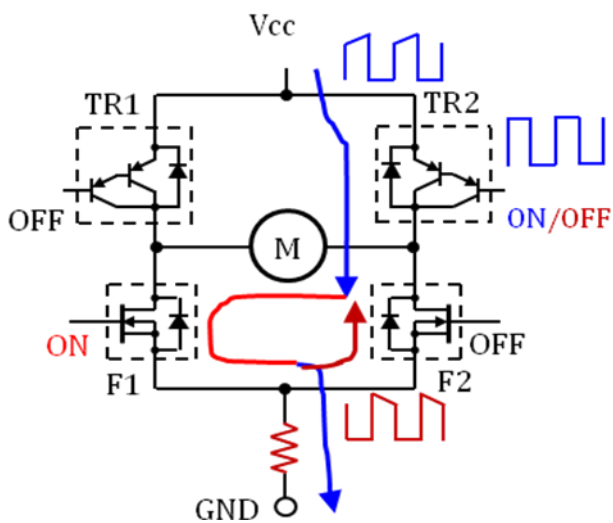
Current control is slow decay.

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.

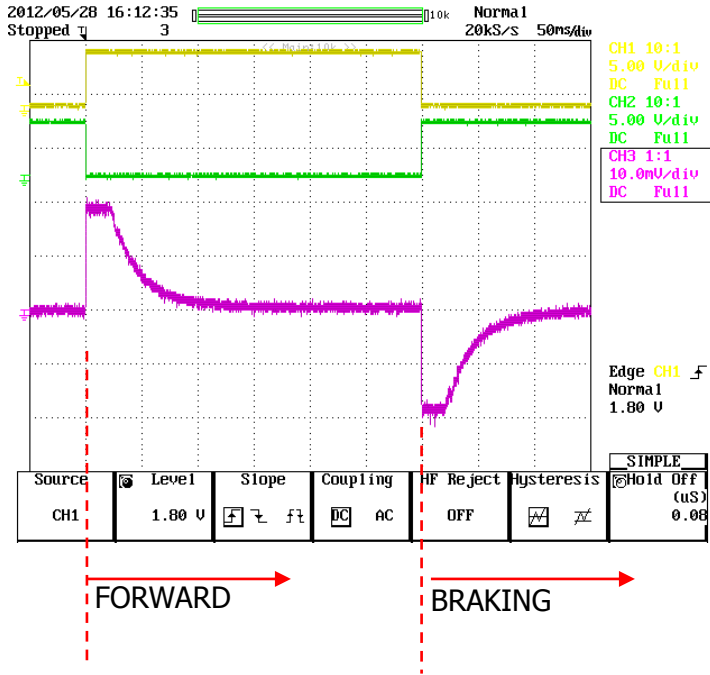
STK681-300, 310

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.