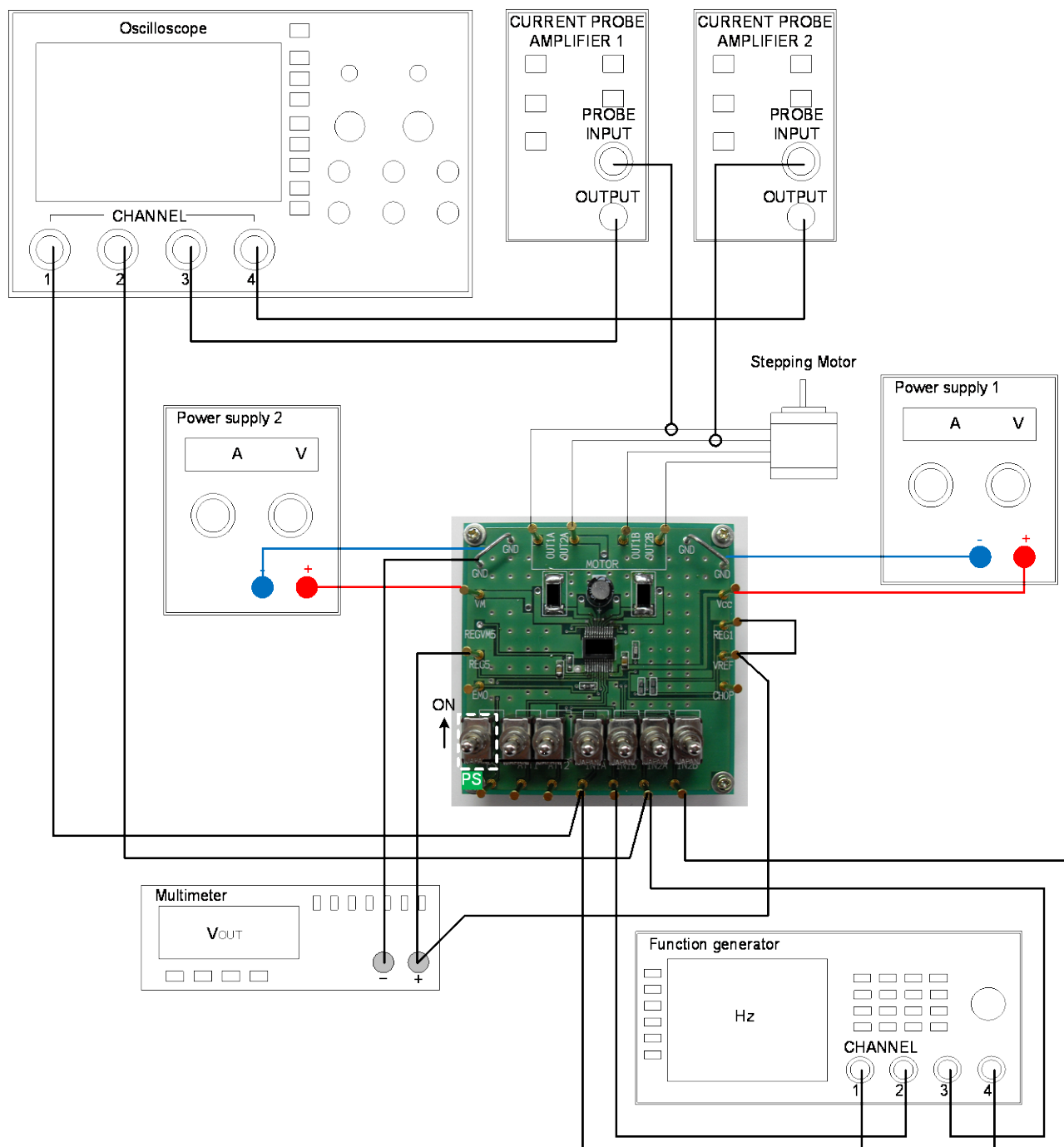# Test Procedure for the LV8711TGEVB Evaluation Board

For Stepper Motor Control

Figure 1: Setup for Stepper Motor Control

Table1: Required Equipment

| Equipment	Efficiency
Power supply1	5V-0.5A
Power supply2	18V-1.5A
Function generator	1kHz
Multimeter	-
Oscilloscope	4 channel
Current probe1	-
Current probe2	-
LV8711T Evaluation Board	-
Stepper Motor	18V-1A

Allowable Operating Ratings

- Motor supply voltage (VM): 4 to 16V
- Logic supply voltage (VCC): 2.7 to 5.5V
- Reference voltage for constant current (VREF): 0 to VCC-1.8V

Each constant setting method for the above circuit diagram example is as follows:

- Current LIMIT (100%) set
  VREF=1V (when internal regulator REG1 output is connected)
  $(I)limit = VREF/5/RNF = 1V/5/0.47\Omega = 425mA$

- Chopping frequency setting
  $Fchop = (I)chop/(Cchop \times Vt \times 2) = 10uA/(180pF \times 0.5V \times 2) = 55.5kHz$

Test Procedure:

1. Connect the test setup as shown Figure 1.
2. Apply input voltage to the terminal VREF.（The terminal REG1 short circuit is assumed.）
3. Turn the switch of "PS" on.（Knock it down for above in Figure 1.）
4. Check VREG5 and frequency of the triangle waveform on the terminal CHOP.
5. Keep other switches in middle position. Input drive signals to IN1A, IN1B, IN2A and IN2B from DSP.
   Refer to the following timing charts.
6. Check the drive signals and output current waveforms at scope whether they are similar to the charts.
   And check the waveform of PWM constant current control.
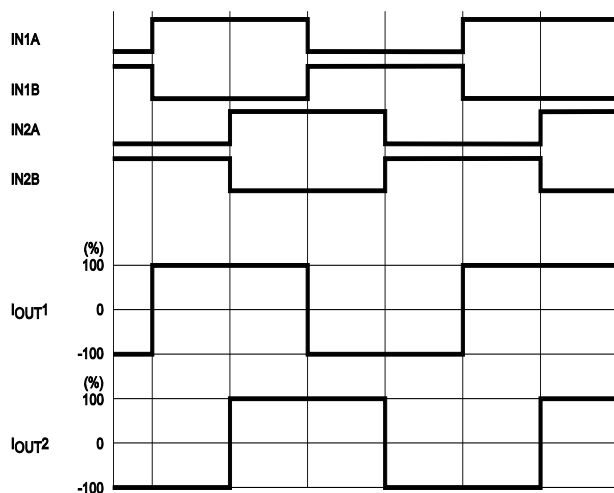
Timing chart of Full-step
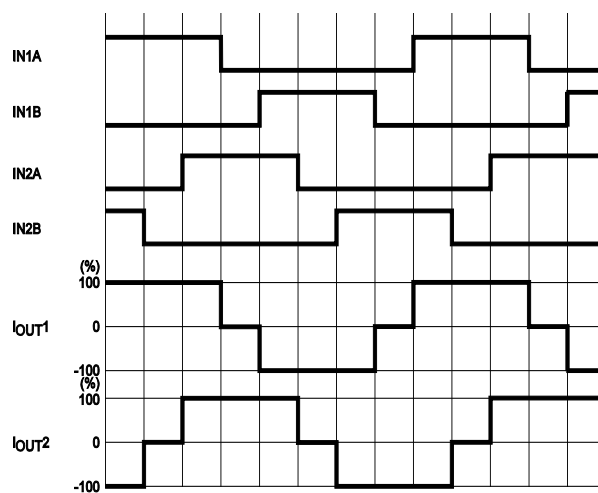
Timing chart of Half-step

Table2: Desired Results

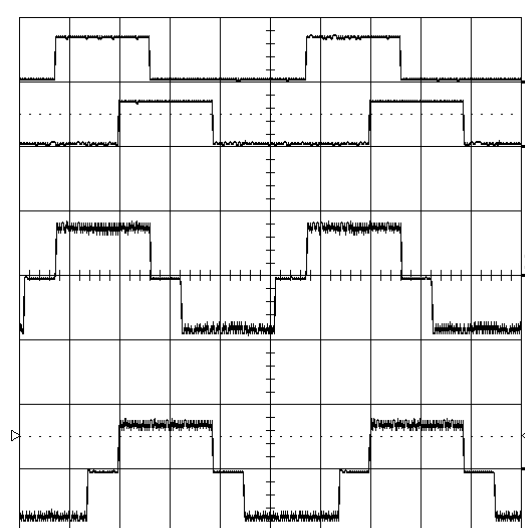| INPUT	OUTPUT
VCC=3.3V (Power Supply 1) VM=8.5V (Power Supply 2) VREF=REG1(=1V) PS=High ATT1=ATT2=Low When it controls in Full-Step IN1A/IN1B/IN2A/IN2B=10Hz(Duty50%) When it controls in Half-Step IN1A/IN1B/IN2A/IN2B=10Hz(Duty40%)	VREG5=4.5V to 5.5V VREG1= 0.95V to 1.05V
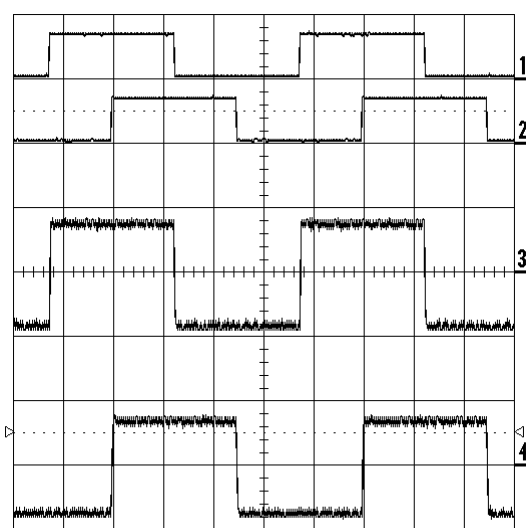
1ch:
IN1A
5V/DIV

2ch:
IN2A
5V/DIV

3ch:
IOUT1
500mA/
DIV

4ch:
IOUT2
500mA/
DIV

Waveforms when it controls in Full-Step
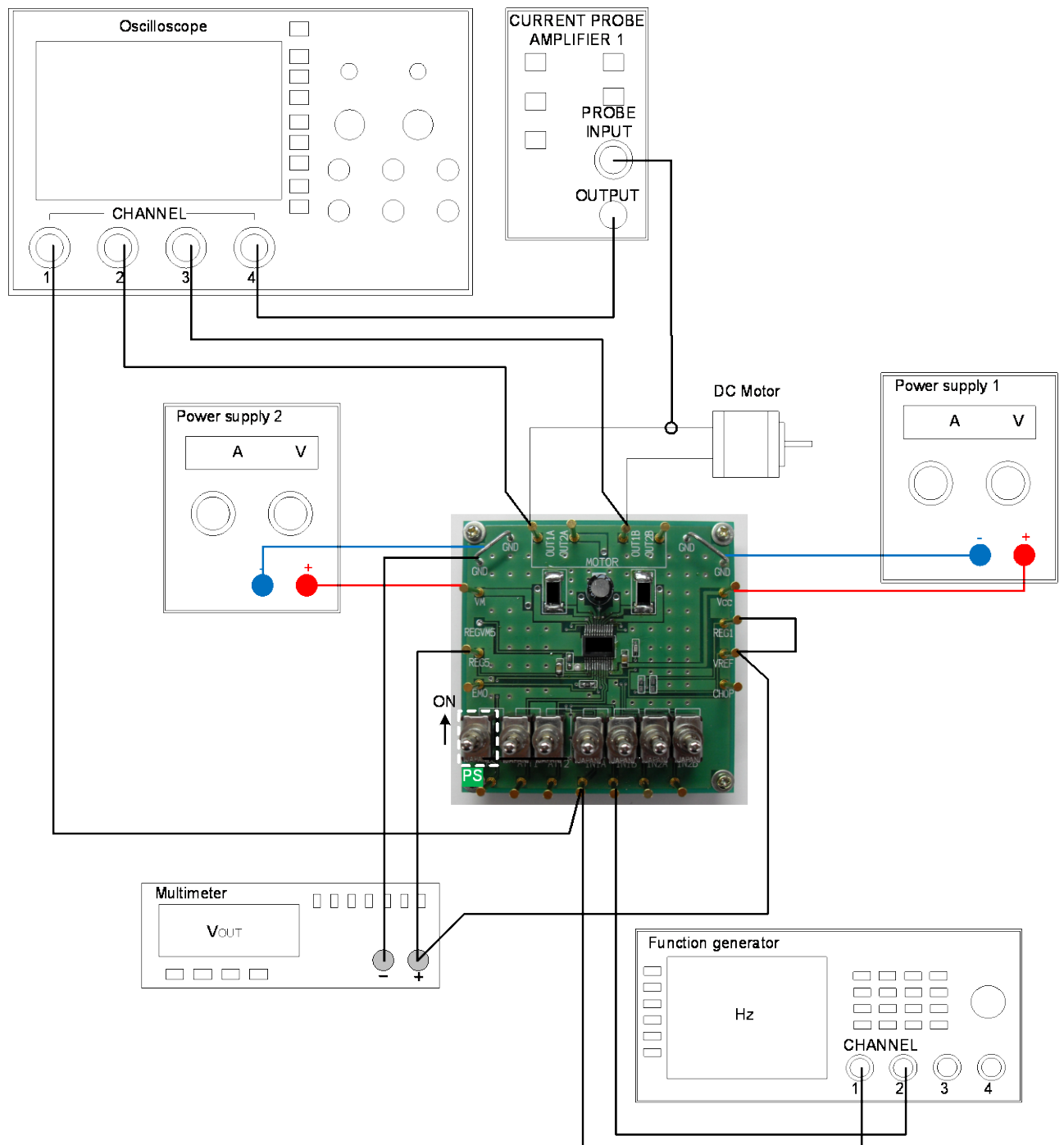
Waveforms when it controls in Half-Step

For smaller DC motor(s) control
(When a motor is connected between OUT1A and OUT1B.)

Figure 2. Setup for smaller DC motor(s) control

Table3: Required Equipment

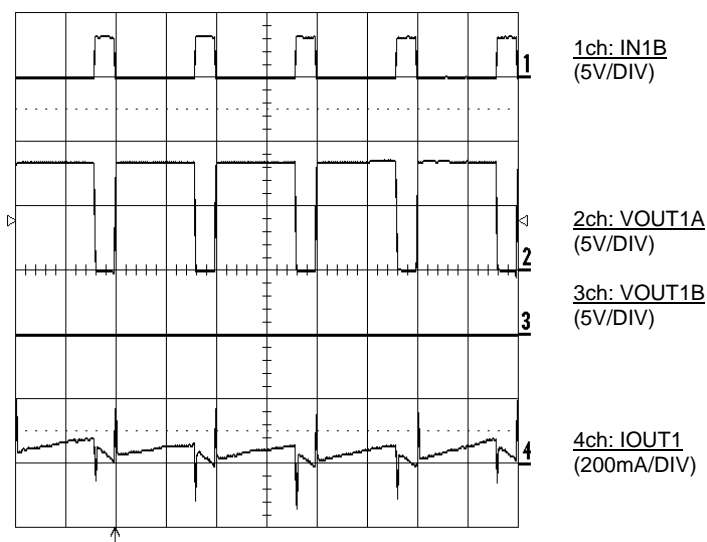| Equipment	Efficiency
Power supply1	5V-0.5A
Power supply2	18V-1.5A
Function generator	200kHz
Multimeter	-
Oscilloscope	4 channel
Current probe1	-
Current probe2	-
LV8711T Evaluation Board	-
DC Motor	18V-1A

Test Procedure
- Connect DC motor(s) between OUT1A and OUT1B, OUT2A and OUT2B.
- Connect the motor power supply with the terminal VM, the control power supply with the terminal VCC.　Connect the GND line with the terminal GND.
- Input the reference voltage to the terminal VREF.
  （The terminal REG1 short circuit is assumed.）
- Turn the switch of "PS" on.（Knock it down for above in follow image.）
- Turn the swith of IN1A, IN1B, IN2A and IN2B ON or OFF.
  When DSP is connected to previous Input pins, keep their switches middle position.
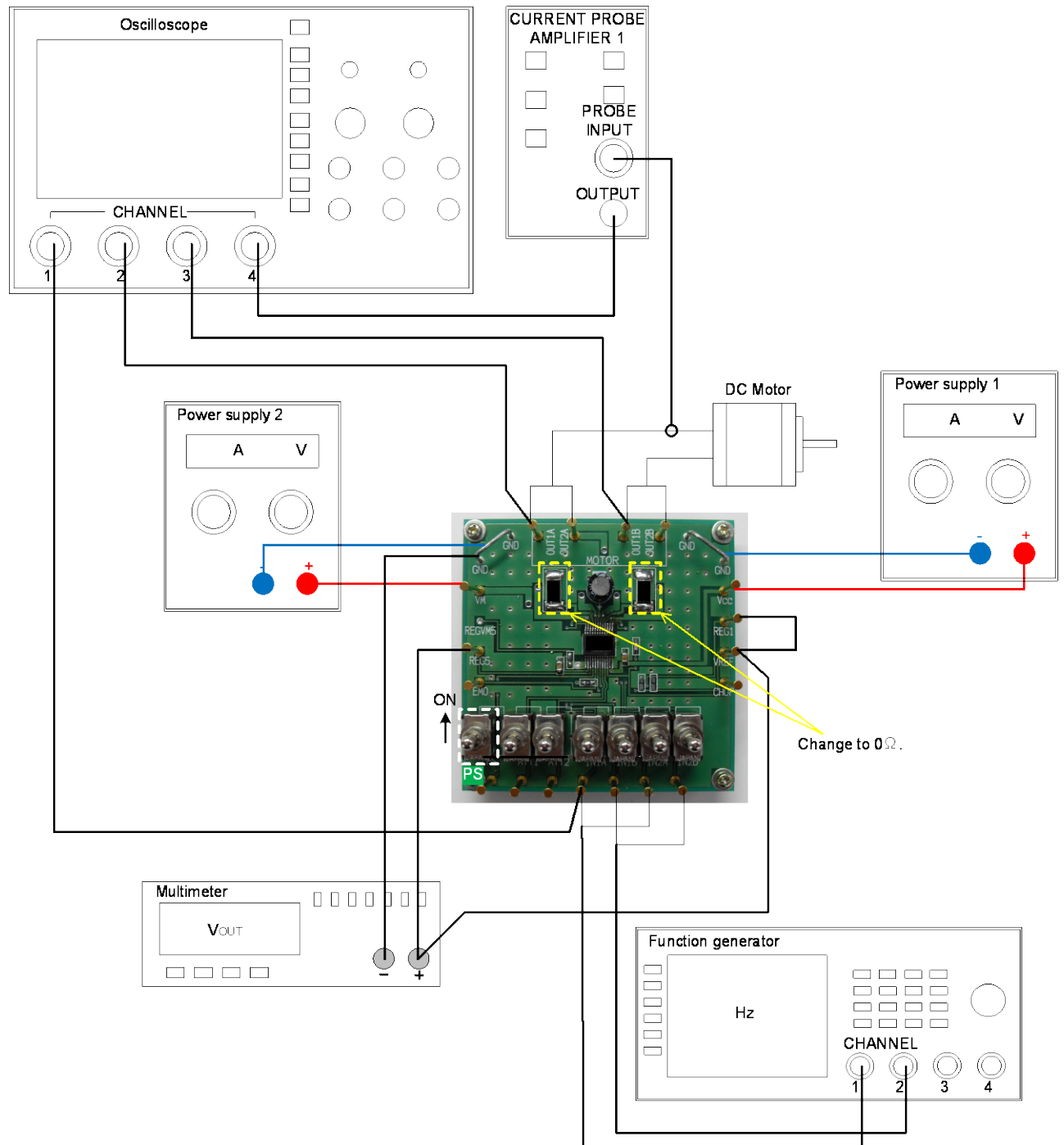 Refer to the following timing chart.

Timing chart of DC motor
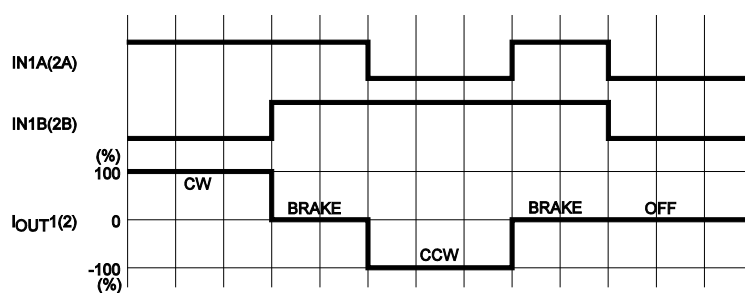
Table4: Desired Results

INPUT	OUTPUT
VCC=3.3V (Power Supply 1) VM=8.5V (Power Supply 2) VREF=REG1(=1V) PS=High ATT1=ATT2=Low When it controls in Direct-PWM (CW/Brake) IN1A/IN2A=High IN1B/IN2B=20kHz(Duty20%)	VREG5=4.5V to 5.5V VREG1= 0.95V to 1.05V

1ch: IN1B (5V/DIV)

2ch: VOUT1A (5V/DIV)

3ch: VOUT1B (5V/DIV)

4ch: IOUT1 (200mA/DIV)

For a larger DC motor control

Figure 3. Setup for a larger DC motor control

Table5: Required Equipment

Equipment	Efficiency
Power supply1	5V-0.5A
Power supply2	18V-2.5A
Function generator	200kHz
Multimeter	-
Oscilloscope	4 channel
Current probe1	-
Current probe2	-
LV8711T Evaluation Board	With RNF resistors 0Ω
DC Motor	18V-2A

Test Procedure

· Change each RNF resistors to 0Ω.
· Connect Output pin OUT1A with OUT2A, OUT1B with OUT2B each other directly.
· Connect Input pin IN1A with IN2A, IN1B with IN2B each other directly.
· Connect DC motor between OUT1A/2A and OUT1B/2B.
· Connect the motor power supply with the terminal VM, the control power supply with the terminal VCC.   Connect the GND line with the terminal GND.
· Connect REG1 to VREF directly.
· Turn the switch of "PS" on.（Knock it down for above in previous image.）
· Turn the swith of IN1A/2A and IN1B/2B ON or OFF.
  When DSP is connected to previous Input pins, keep their switches middle position.
  Refer to the timing chart on P.5.

Table6: Desired Results

INPUT	OUTPUT
VCC=3.3V (Power Supply 1) VM=12V (Power Supply 2) VREF=REG1(=1V) PS=High ATT1=ATT2=Low When it controls in Direct-PWM (CW/Brake) IN1A/IN2A=High IN1B/IN2B=100kHz(Duty50%)	VREG5=4.5V to 5.5V VREG1= 0.95V to 1.05V

In this case, waveforms are similar to them on P.5.