ON Semiconductor®

Test Procedure for the LV8712TGEVB Evaluation Board

For Stepper Motor Control

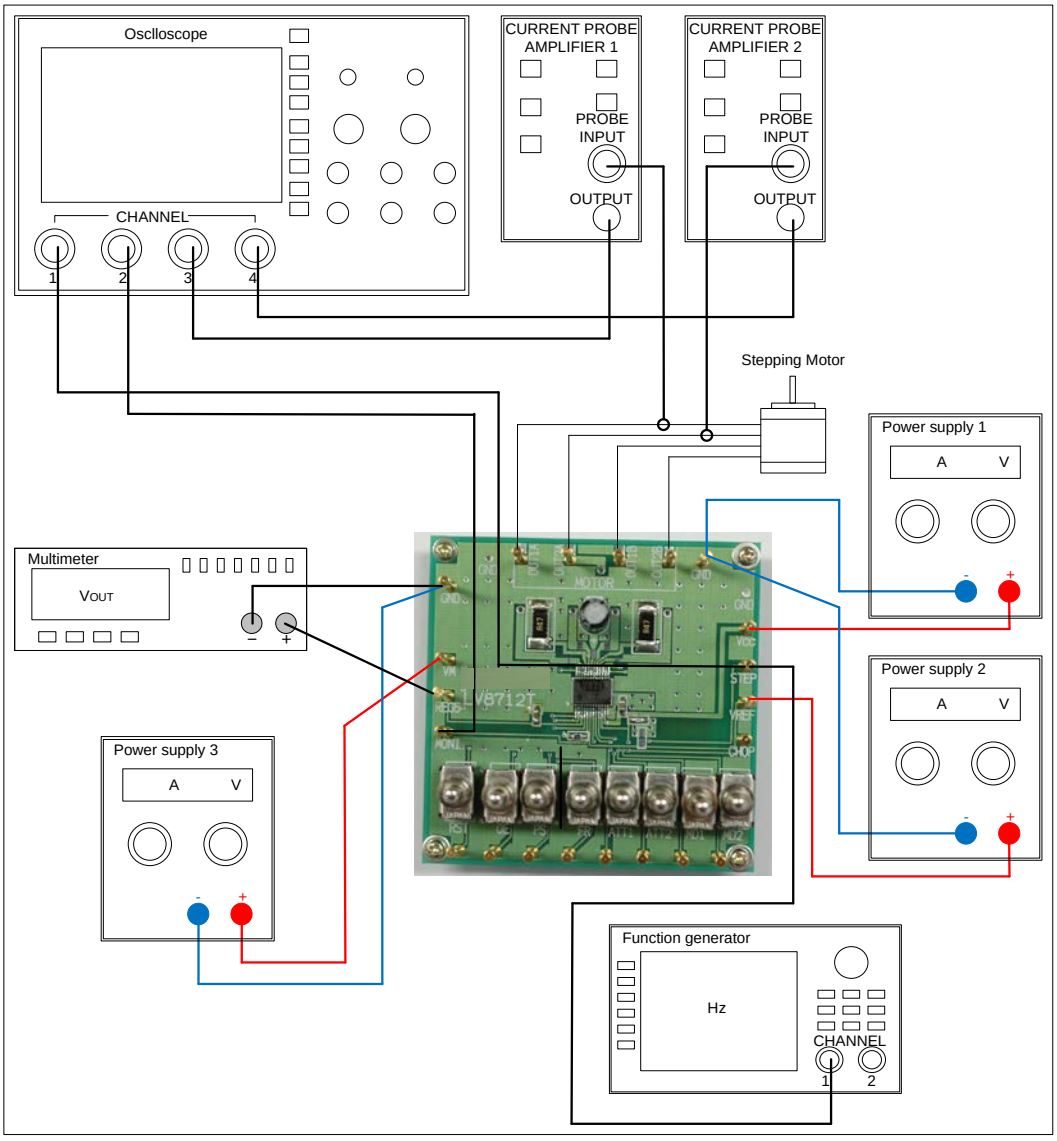

Table1: Required Equipment

Equipment	Efficiency
Power supply1	10V-1A
Power supply2	5V-0.5A
Power supply3	20V-2A
Function generator	50kHz
Multimeter	-
Oscilloscope	4 channel
Current probe1	-
Current probe2	-
LV8712T Evaluation Board	-
Stepper Motor	20V-1A

Test Procedure:

1. Connect the test setup as shown above.
2. Set it according to the following specifications.

Supply Voltage

- VM (4 to 16V) : Motor Power Supply
- VCC (2.7 to 5.5V) : Control Power Supply
- VREF (0 to VCC-1.8V) : Const. Current Control for Reference Voltage

Toggle Switch State

- Upper Side: High (VCC)
- Middle: Open, enable to external logic input
- Lower Side: Low (GND)

Operations Guide

1. **Initial Condition Setting:** Set "Open or Low" all switches.
2. **Motor Connection:** Connect the Motors between OUT1A and OUT1B, between OUT2A and OUT2B.
3. **Power Supply:** Supply DC voltage to VCC, VM and VREF.
4. **Ready for Operation from Standby State:** Turn "High" the PS pin toggle switch. Channel 1 and 2 are into full-step excitement initial position (100%, -100%) .
5. **Motor Operation:** Turn "High" the RST pin toggle switch. Input the clock signal into the STEP pin.
6. **Other Setting:** (See Application Note for detail)
   i. ATT1, ATT2: Motor current attenuation.
   ii. FR: Motor rotation direction (CW / CCW) setting.
   iii. MD1, MD2: Microstep Resolution.
   iv. OE: Output Enable.

Setting for External Component Value

1. Constant Current (100%)
   At VREF = 1.0V
   Iout = VREF [V]/5/RNF [ohm]
   =1.0 [V] / 5 / 0.47 [ohm]
   =0.426 [A]

2. Chopping Frequency
   Fchop =Ichop [uA]/(Cchop x Vt x 2)
   =10 [uA] / (180 [pF] x 0.5 [V] x 2)
   =55 [kHz]

3. Check REG5 pin voltage at multimeter.
4. Check the STEP and MONI pin voltage at scope CH1 and CH2, and the output current

waveform at scope CH3 and CH4.

Table2: Desired Results

INPUT	OUTPUT
VM=12V VREF=1.0V VCC=5V PS=High RST=High ATT1=ATT2=FR=OE=Low	REG5=4.5V to 5.5V

5. Oscilloscope Waveform

Figure 1.
Full-step (MD1=MD2=Low, fSTEP=500Hz)

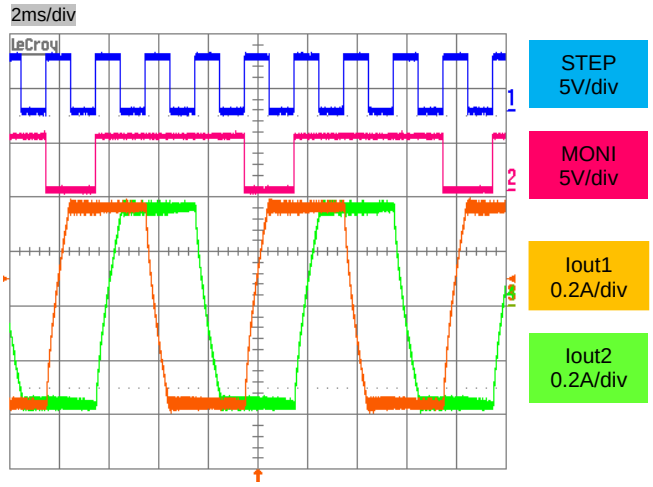

Figure 2.
Half-step (MD1=High,MD2=Low, fSTEP=1kHz)

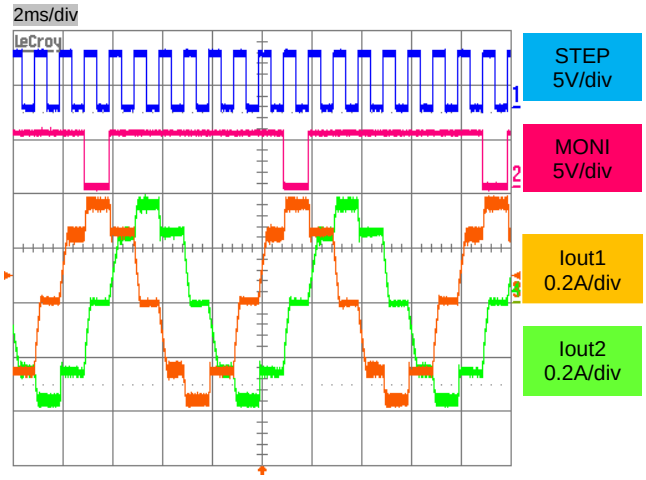

Figure 3.
Quarter-step (MD1=Low,MD2=High, fSTEP=2kHz)

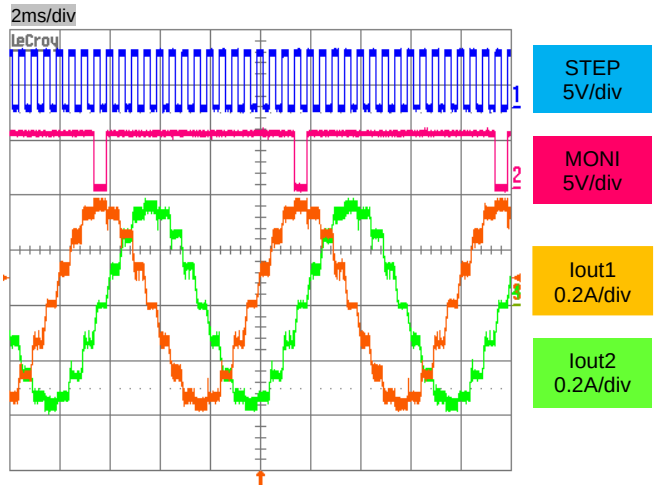

Figure 4.
1/8-step(MD1=MD2=High, fSTEP=4kHz)