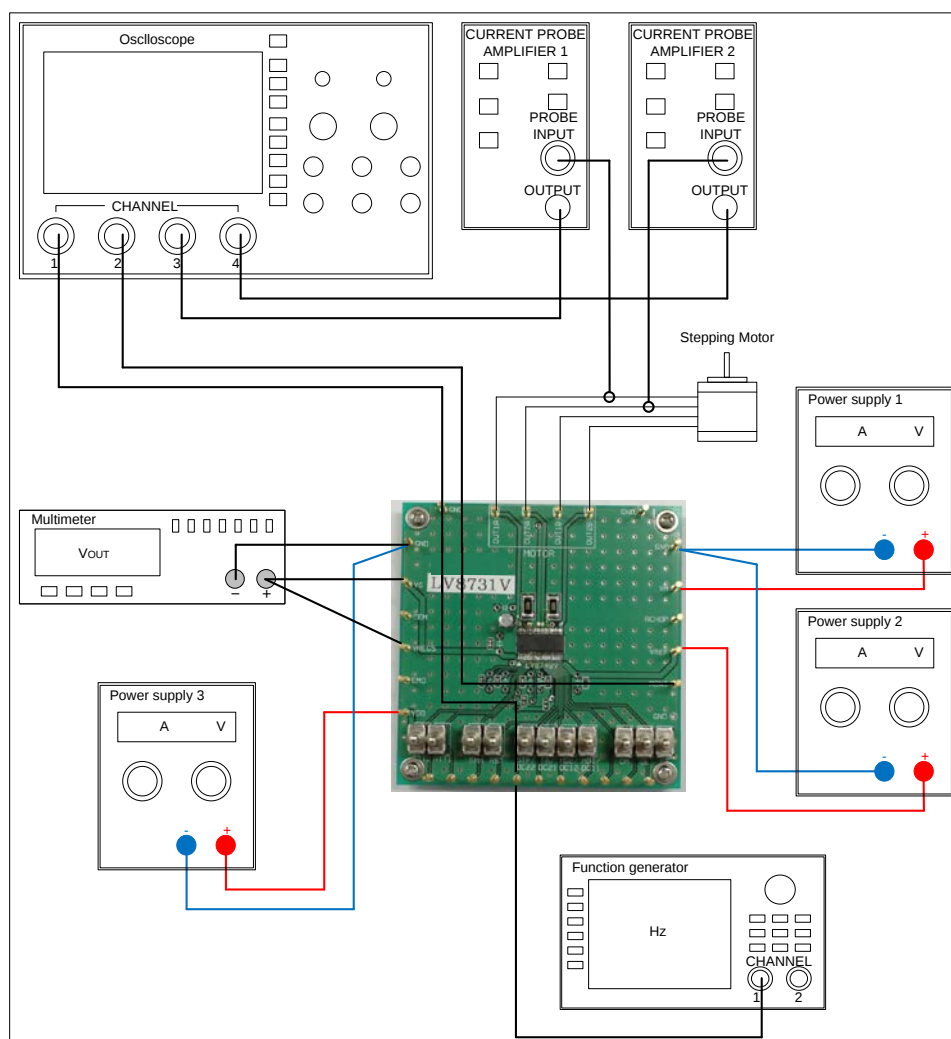


# Test Procedure for the LV8731VGEVB Evaluation Board

## For Stepper Motor Control



**Table1: Required Equipment**

| Equipment                | Efficiency |
|--------------------------|------------|
| Power supply1            | 35V-5A     |
| Power supply2            | 5V-0.5A    |
| Power supply3            | 10V-1A     |
| Function generator       | 200kHz     |
| Multimeter               | -          |
| Oscilloscope             | 4 channel  |
| Current probe1           | -          |
| Current probe2           | -          |
| LV8731V Evaluation Board | -          |
| Stepper Motor            | 35V-3A     |



## Test Procedure:

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

### Supply Voltage

- VM (9 to 32V): Power Supply for LSI
- VREF (0 to 3V): Const. Current Control for Reference Voltage
- VDD (2 to 5V): Logic “High” voltage for toggle switch

### Toggle Switch State

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

### Operations Guide

1. **Initial Condition Setting:** Set “Open” the toggle switch STEP/D22, and “Open or Low” the other switches.
2. **Power Supply:** Supply DC voltage to VM, VREF and VDD.
3. **Ready for Operation from Standby State:** Turn “High” the ST terminal toggle switch. Channel 1 and 2 are into 2-phase excitement initial position (100%, -100%) .
4. **Motor Operation:** Input the clock signal into the terminal STEP/DC22.
5. **Other Setting:** (See Application Note for detail)
  - i. ATT1, ATT2: Motor current attenuation.
  - ii. EMM: Short circuit protection mode change.
  - iii. RST/BLK: Initial Mode.
  - iv. FR/DC21: Motor rotation direction (CW/CCW) setting.
  - v. MD1/DC11, MD2/DC12: Excitation mode.
  - vi. OE: Output Enable.

### Setting for External Component Value

1. Constant Current (100%)  
 At VREF = 1.0V  

$$I_{out} = VREF [V] / 5 / RNF [ohm]$$

$$= 1.0 [V] / 5 / 0.47 [ohm]$$

$$= 0.426 [A]$$
2. Chopping Frequency  

$$F_{chop} = I_{chop} [uA] / (C_{chop} \times V_t \times 2)$$

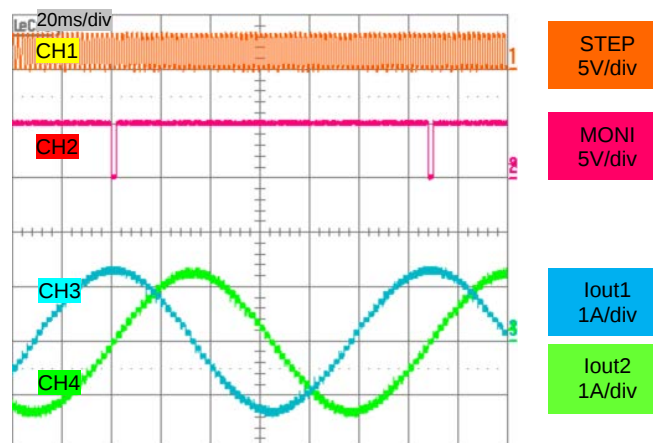
$$= 10 [uA] / (180 [pF] \times 0.5 [V] \times 2)$$

$$= 55 [kHz]$$
3. Check VREG5 and VG terminal voltage at multimeter.
4. Check the STEP/DC22 and MONI terminal voltage at scope CH1 and CH2, and the

output current waveform at scope CH3 and CH4.

**Table2: Desired Results**

| INPUT                                                                                                                                                                       | OUTPUT                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| VM=24V<br>VREF=1.5V<br>VDD=5V<br>ST=High<br>DM=Low<br>EMM=Low, RST/BLK=Low,<br>OE=Low<br>ATT1=ATT2=Low<br>FR/DC21=Low<br>MD1/DC11=MD2/DC12=High<br>STEP/DC22=500Hz(Duty50%) | VREG5=4.5V to<br>5.5V<br>VG=28V to 29.8V |



## For DC Motor Control

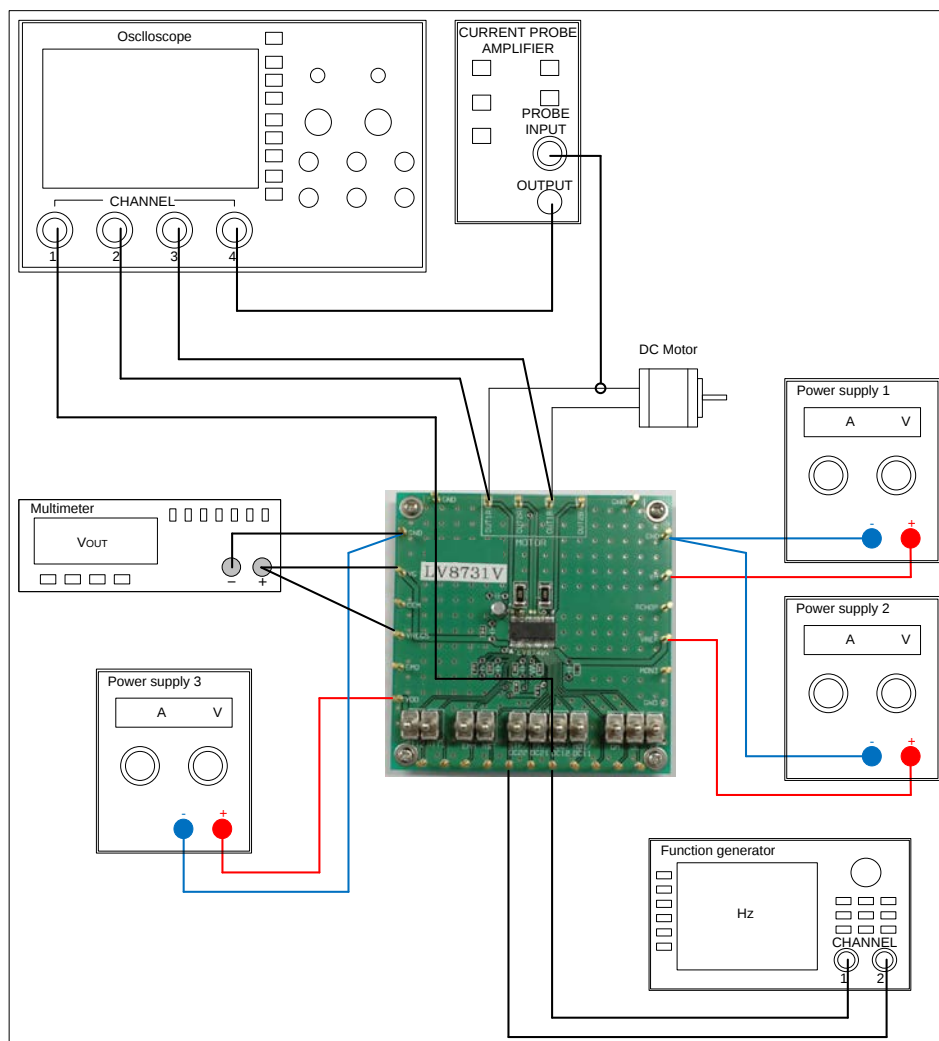


Table3: Required Equipment

| Equipment                | Efficiency |
|--------------------------|------------|
| Power supply1            | 35V-5A     |
| Power supply2            | 5V-0.5A    |
| Power supply3            | 10V-1A     |
| Function generator       | 200kHz     |
| Multimeter               | -          |
| Oscilloscope             | 4 channel  |
| Current probe            | -          |
| LV8731V Evaluation Board | -          |
| DC Motor                 | 35V-3A     |



## Test Procedure:

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

### Supply Voltage

- VM (9 to 32V): Power Supply for LSI
- VREF (0 to 3V): Const. Current Control for Reference Voltage
- VDD (2 to 5V): Logic “High” voltage for toggle switch

### Toggle Switch State

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

### Operations Guide

1. **Initial Condition Setting:** Set “Open” the toggle switch DM, and “Open or Low” the other switches.
  2. **Power Supply:** Supply DC voltage to VM, VREF and VDD.
  3. **Ready for Operation from Standby State:** Turn “High” the ST terminal toggle switch. Channel 1 and 2 are into 2-phase excitement initial position (100%, -100%) .
  4. **Motor Operation:** Set MD1/DC11, MD2/DC12, FR/DC21, and STEP/DC22 terminals according to the purpose.
  5. **Other Setting:** (See Application Note for detail)
    - i. ATT1, ATT2: Motor current attenuation.
    - ii. EMM: Short circuit protection mode change.
    - iii. RST/BLK: Initial Mode.
    - iv. OE: Output Enable.
3. Check VREG5 and VG terminal voltage at multimeter.
  4. Check the MD2/DC12, OUT1A, and OUT1B terminal voltage at scope CH1, CH2, and CH3, and the output current waveform at scope CH4.
  5. Switch to channel 2(STEP/DC22, OUT2A, OUT2B) as well as channel 1(MD2/DC12, OUT1A, OUT1B) and measure it.

**Table4: Desired Results**

| INPUT                                                                                                                                                                         | OUTPUT                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| VM=24V<br>VREF=1.5V<br>VDD=5V<br>ST=High<br>DM=High<br>EMM=Low, RST/BLK=Low,<br>OE=Low<br>ATT1=ATT2=Low<br>FR/DC21=STEP/DC22=Low<br>MD1/DC11=High<br>MD2/DC12=100kHz(Duty50%) | VREG5=4.5V to<br>5.5V<br>VG=28V to 29.8V |

