Test Procedure for the “M-DrAGON” LV8806QAGEVK Evaluation Kit

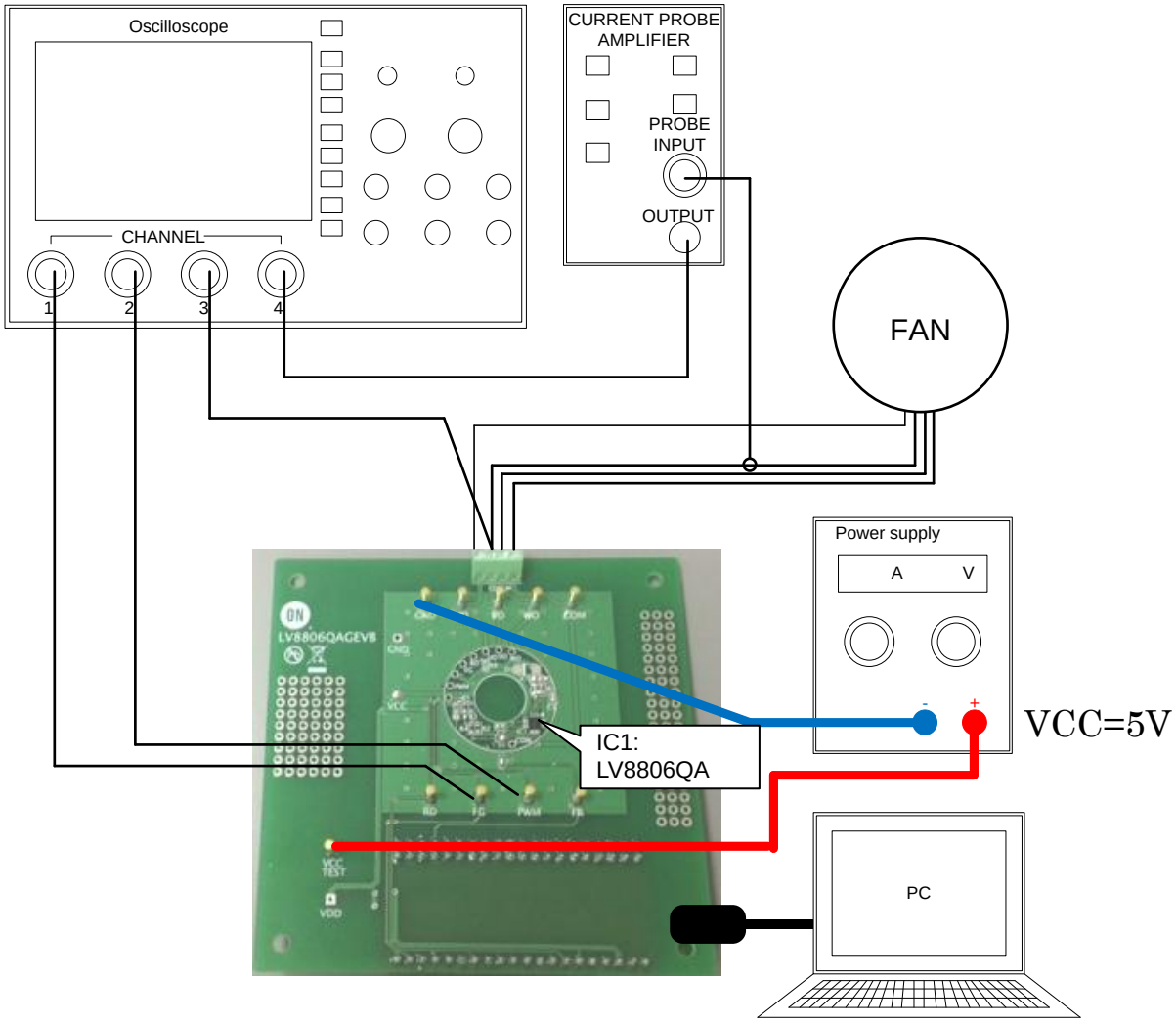
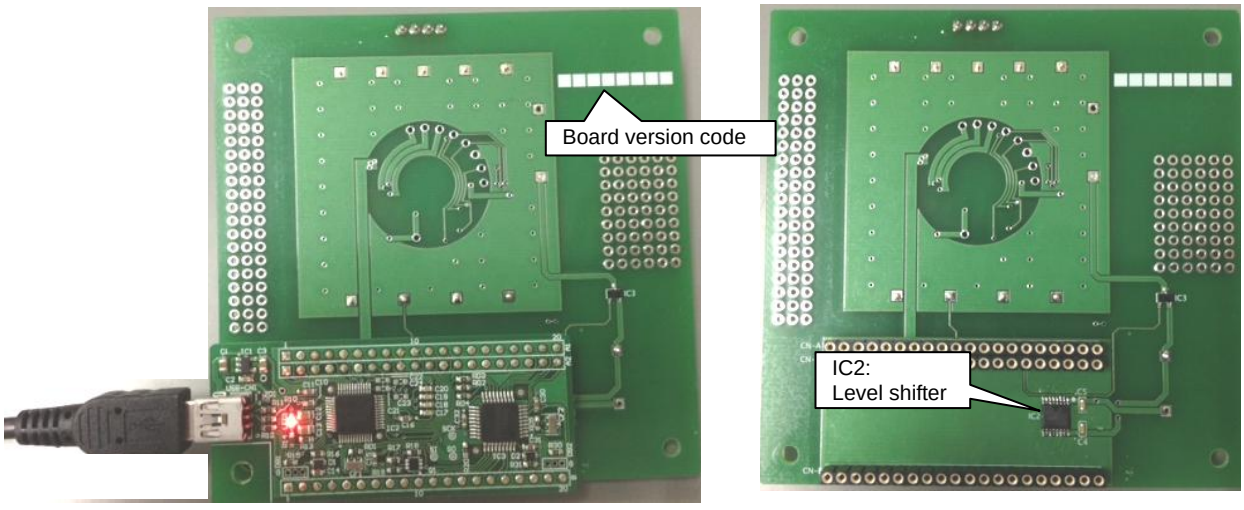


Figure 1. Setup for motor control



With the Daughter Board plugged into USB

Without the Daughter Board

Figure 2. Bottom view of the Evaluation Board

Table1: Reference Equipment

Equipment	Specifications
DC Power supply	5V
Oscilloscope	4 channel
BLDC Motor	3 phase sensorless FAN motor 5V-0.4A
Current probe	
LV8829LFQAGEVB Evaluation Board	
MOTOR DRIVER DAUGHTER BOARD	
USB Type A to Type mini-B cable	
PC with M-DrAGON* GUI installed	32bit: Windows XP(SP3) / 7 /8 64bit: Windows 7

*) It means "Motor- Driver And GUI produced by ON semiconductor".

Test Procedure

- Connect the test setup as shown Figure 1.
- It is important to follow the order shown for starting the system:
    1. Plug a USB cable into the Daughter Board.
    2. Start up the GUI for LV8805.
    3. Apply input voltage to the terminal "VCCTEST".
    4. Apply drive signals with GUI (See below).

- Always remove Vcc before unplugging the daughter board.

GUI Operation

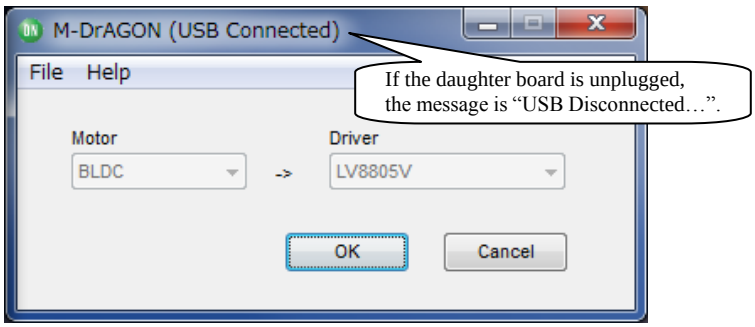


Figure 3. The first window of M-DrAGON

When you double click the icon the above window appears.

1. Select "BLDC" in Motor Type.
2. Select "LV8806" in Driver type.
3. Push the "OK" button.
4. The following windows should appear:

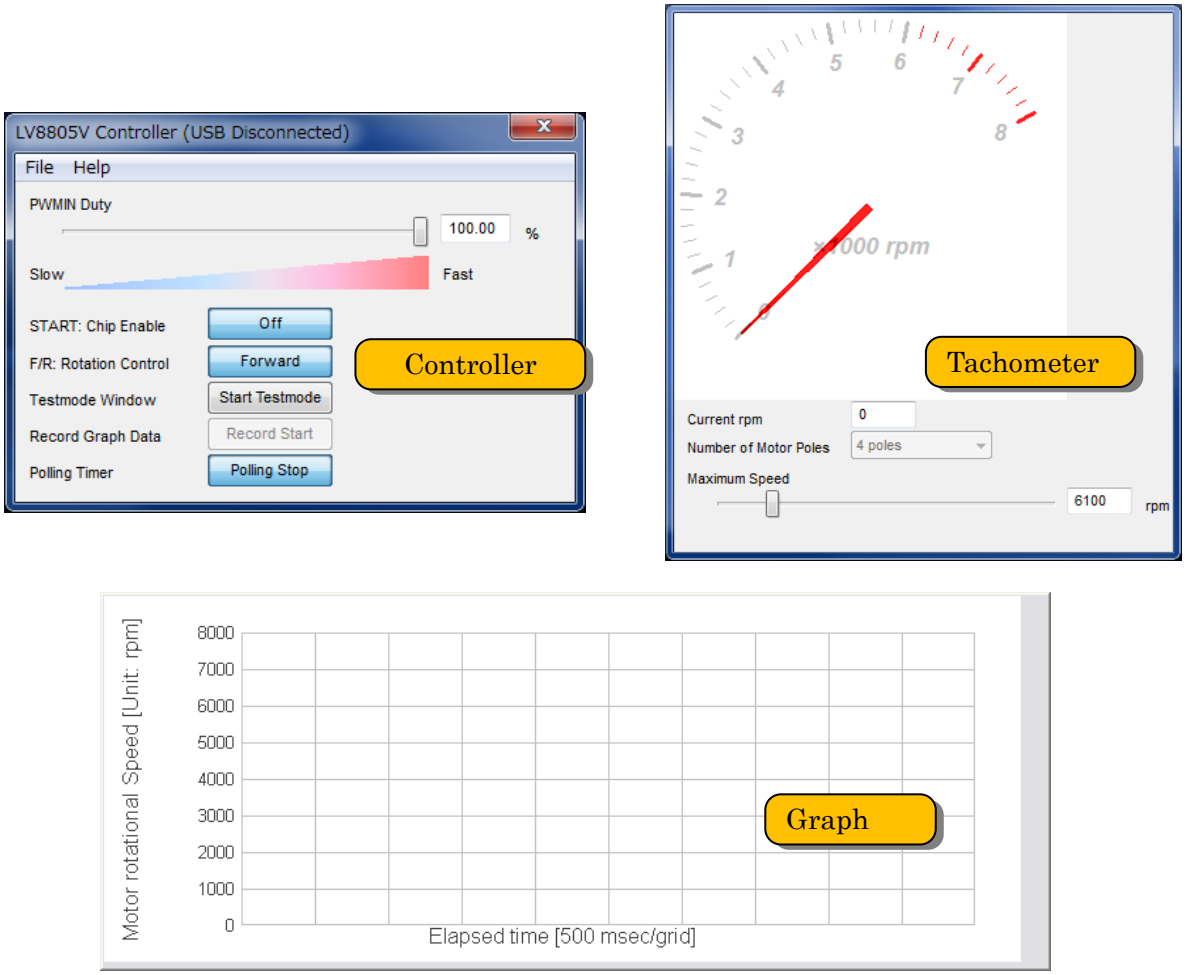


Figure 4. GUI windows for LV8806

- Controller window

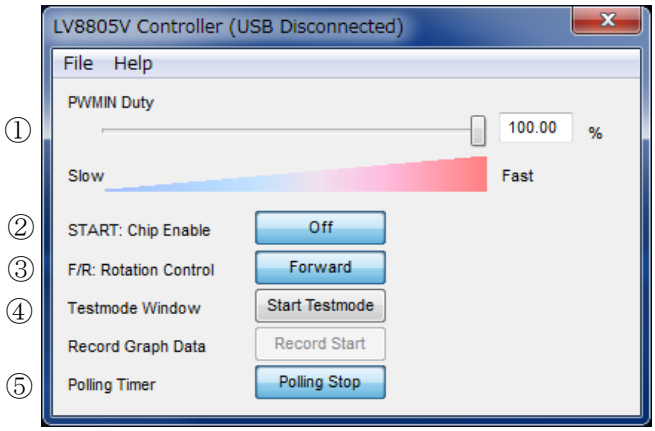


Figure 5. Controller window

①PWMIN Duty：It can control Duty0 %～ 100% of the PWM input signal.
Please input directly in the box or drug & slide the control bar.

②S/S: Chip Enable：It change the start and stop of the motor.
- ✧ "Start" indicate when the fan stop. And this bottan push then the fan strat.
- ✧ "Stop" indicate when the fan start. And this bottan push then the fan stop.

③F/R：It change the fowerd rotation and reverse rotation of the motor.

④Test morde Window：It open the test mode window.
The operation procedure of Test mode window explain at the following

⑤Polling Timer：It is pushed then the change of the number of the fan rotation is displayed in real time in the graph.

- Tachometer window

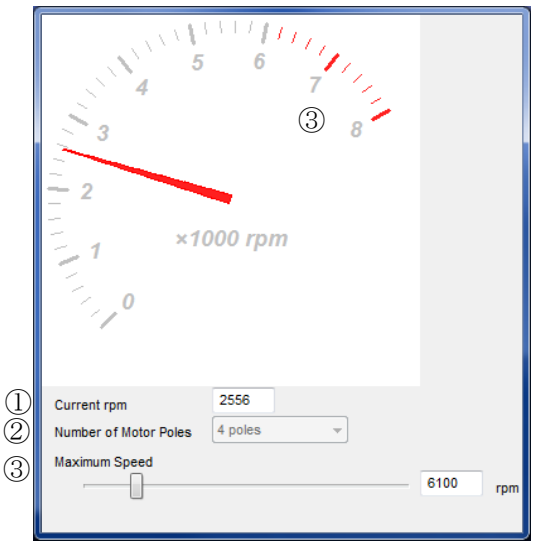


Figure 6. The tachometer window

①Current rpm：This displays fan RPM.
The calculation formula is given below.

$$rpm = \left(FG_friquency \times \frac{2}{N} \right) \times 60$$

*N=② Number of motor poles

②Number of motor poles： Set up the number of poles of the fan.

- Choose "N/A" when you don't know the nunber of poles of the fan.

③Maximum Speed： Adjust the renge of the graph axis and tachometer when you input directly in the box or drag & slide the control bar.

- Graph window

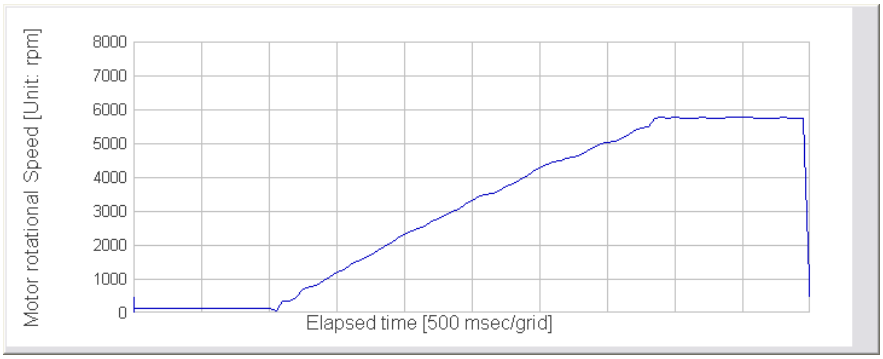
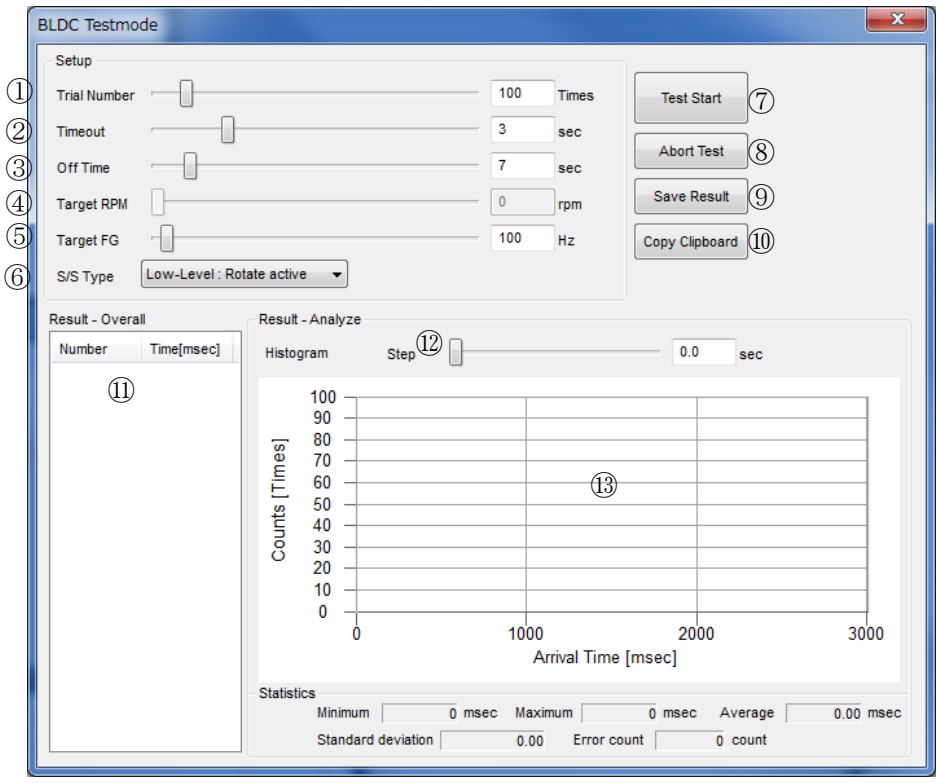


Figure 7. The graph window

This graph shows X-axis:time and vertical-axis:rotations speed.

・Test mode window



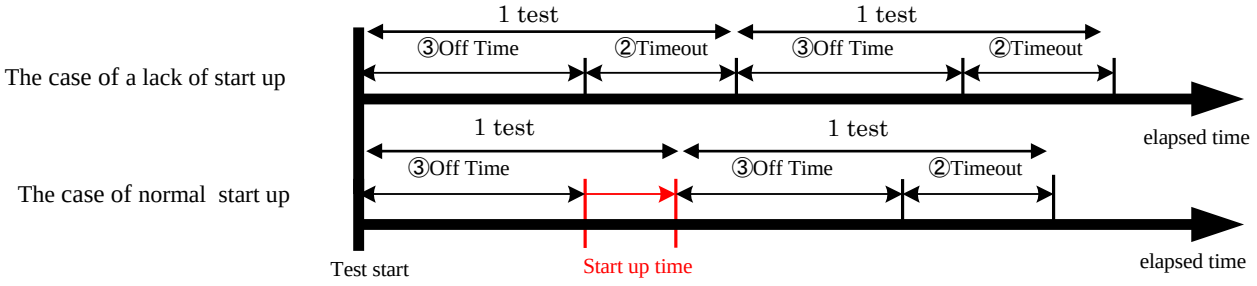
Each parameter setup

① Trial Number：The test number of trials

② Timeout：This is the time allocated for startup.

③ Off time：This is the minimal time the fan will remain off prior to beginning a test.

The relation between ② and ③ is shown below.



*It change ② to ③ immediately When the fan starting up is detected to within a time.

④,⑤Target number-of-rotations setup

(Tachometer window: Setup ④ when you chose xx poles and setup ⑤ when you chose N/A at the ② Number of motor poles.)

④ Target RPM:. When the motor reaches the Target RPM the startup mode is complete.

⑤ Target FG：Similar to target RPM but accounts for the number of poles. Generally 70% of maximum FG.

⑥S/SType：Choose “Low-Level: Rotate active”.

⑥ Test Start：Start a test.

⑦ Abort Test：Abort a test.

⑧ Save Result：This saves the result of the test as a data file.

⑨ Copy Clipboard：This copies the result of the test as a text file on the clip board.

Test result is displayed at ⑪,⑬.

⑩ Test times and start up time are displayed.

⑬The histogram(y-axis:times/ x-axis:start up time) is displayed.

⑫Slide the control bar to adjust the step of x-axis in the histogram

Table2: Example 1

INPUT	OUTPUT
VCC=5V (Power Supply) PWMIN duty= 100% F/R= forward	Motor rotational speed = approx. 4000rpm

Waveforms during the motor rotation (5mSec/div) Zoom in the red box area in the left fig (20uSec/div)

Figure 8. The image of waveforms for example 1

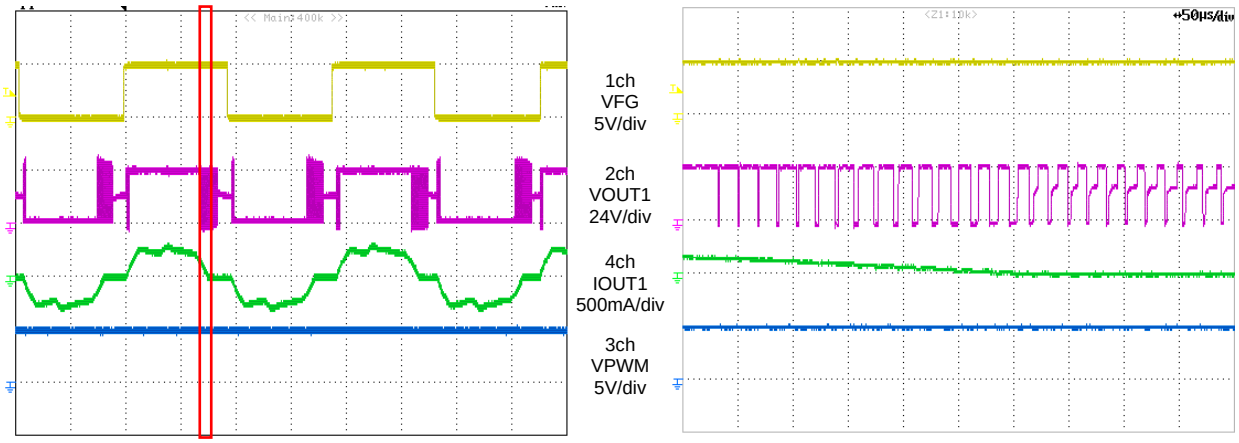
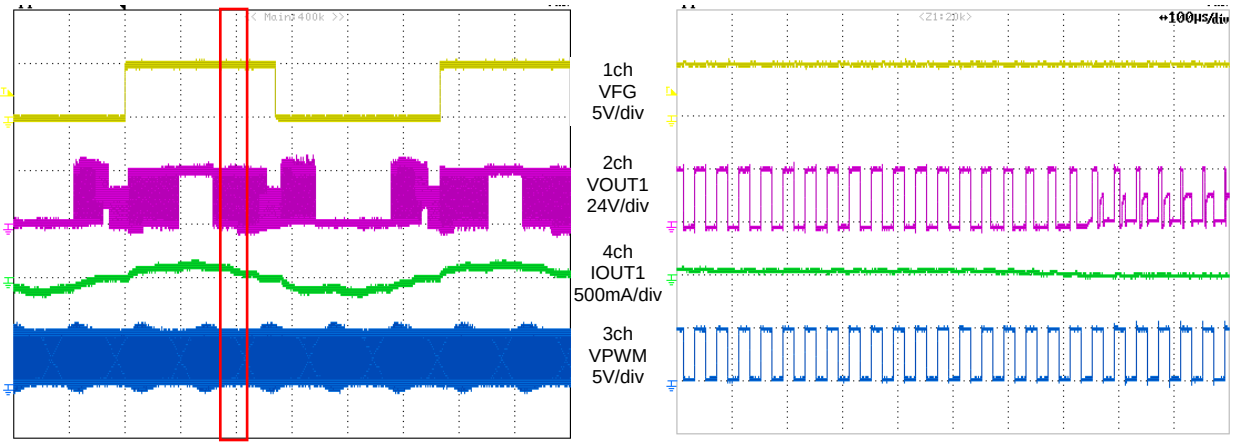


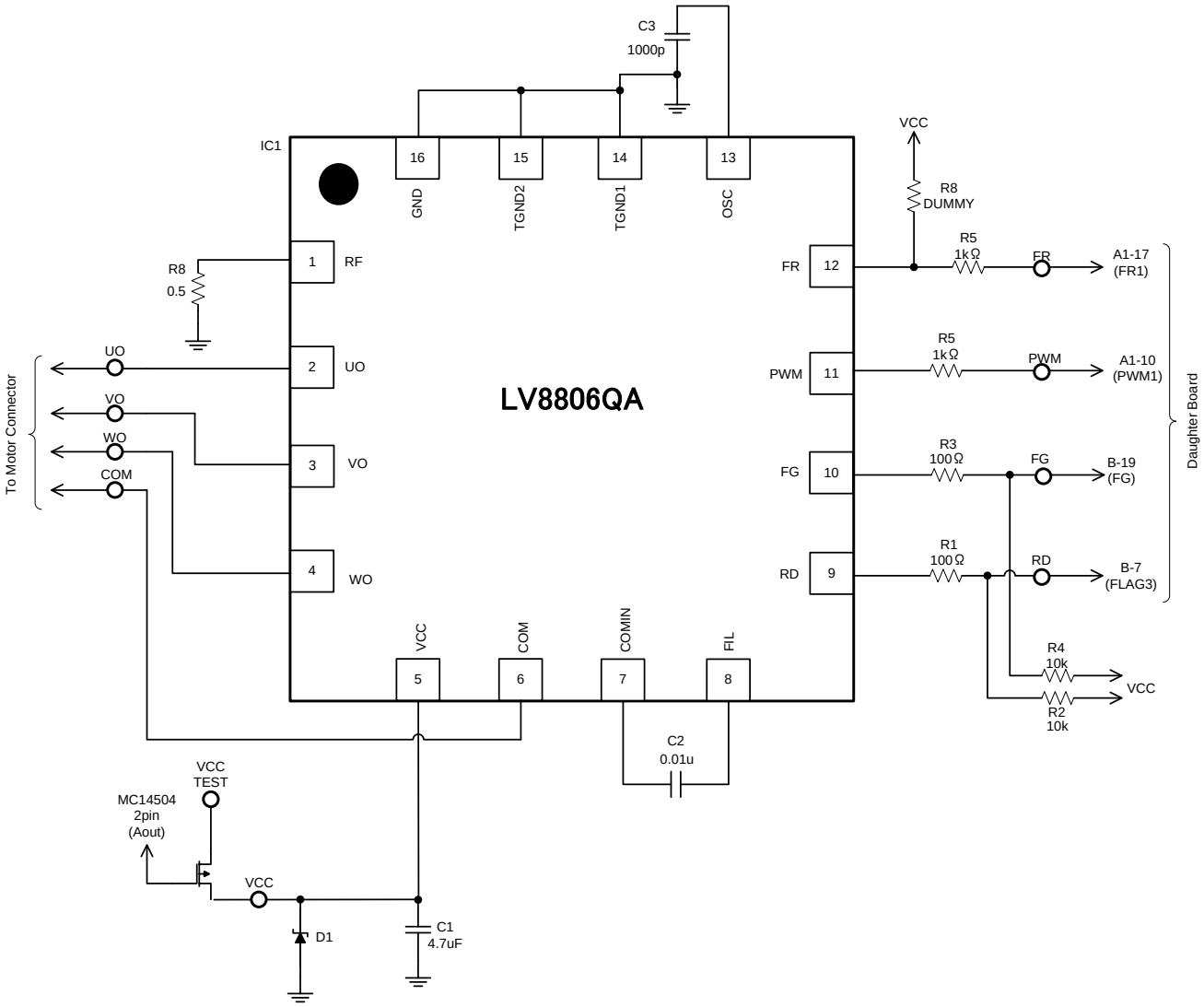
Table3: Example 2

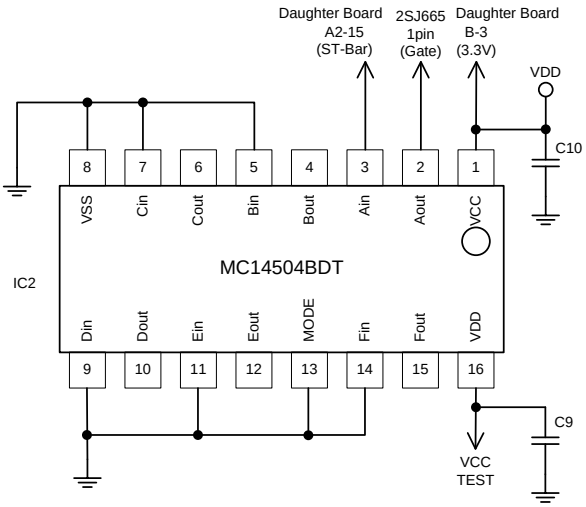
INPUT	OUTPUT
VCC=5V (Power Supply) PWMIN duty= 50% F/R= forward	Motor rotational speed =approx. 2700rpm

Waveforms during the motor rotation (2mSec/div) Zoom in the red box area in the left fig (20uSec/div)

Figure 9. The image of waveforms example 2




C3
1000p
IC1
16
15
14
13
GND
TGND2
TGND1
OSC
VCC
R8
DUMMY
R8
0.5
1
RF
FR
12
R5
1kΩ
FR
A1-17
(FR1)
UO
2
UO
LV8806QA
PWM
11
R5
1kΩ
PWM
A1-10
(PWM1)
To Motor Connector
VO
WO
COM
3
VO
FG
10
R3
100Ω
FG
B-19
(FG)
Daughter Board
4
WO
RD
9
R1
100Ω
RD
B-7
(FLAG3)
VCC
COM
COMIN
FIL
5
6
7
8
R4
10k
VCC
R2
10k
C2
0.01u
VCC
TEST
MC14504
2pin
(Aout)
VCC
D1
C1
4.7uF


Daughter Board
A2-15
(ST-Bar)
2SJ665
1pin
(Gate)
Daughter Board
B-3
(3.3V)
VDD
C10
8
7
6
5
4
3
2
1
VSS
Cin
Cout
Bin
Bout
Ain
Aout
VCC
IC2
MC14504BDT
Din
Dout
Ein
Eout
MODE
Fin
Fout
VDD
9
10
11
12
13
14
15
16
C9
VCC
TEST

Cautions

- This system is intended for an initial evaluation of LV8806QA. We will not guarantee measured values as full evaluation and validation must be performed on your system independently.
- Never hold the motor with the lead wire or shaft. The motor should be affixed to a stand prior to operation.
- Attach all motor leads prior to application of power.

Safety

- Do not touch the rotating part when the motor is powered. Doing so may result in injury.
- Do not touch conductive parts such as connectors when the motor is powered. Doing so may result in electric shocks.

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