Test Procedure for the NCV7546EVB

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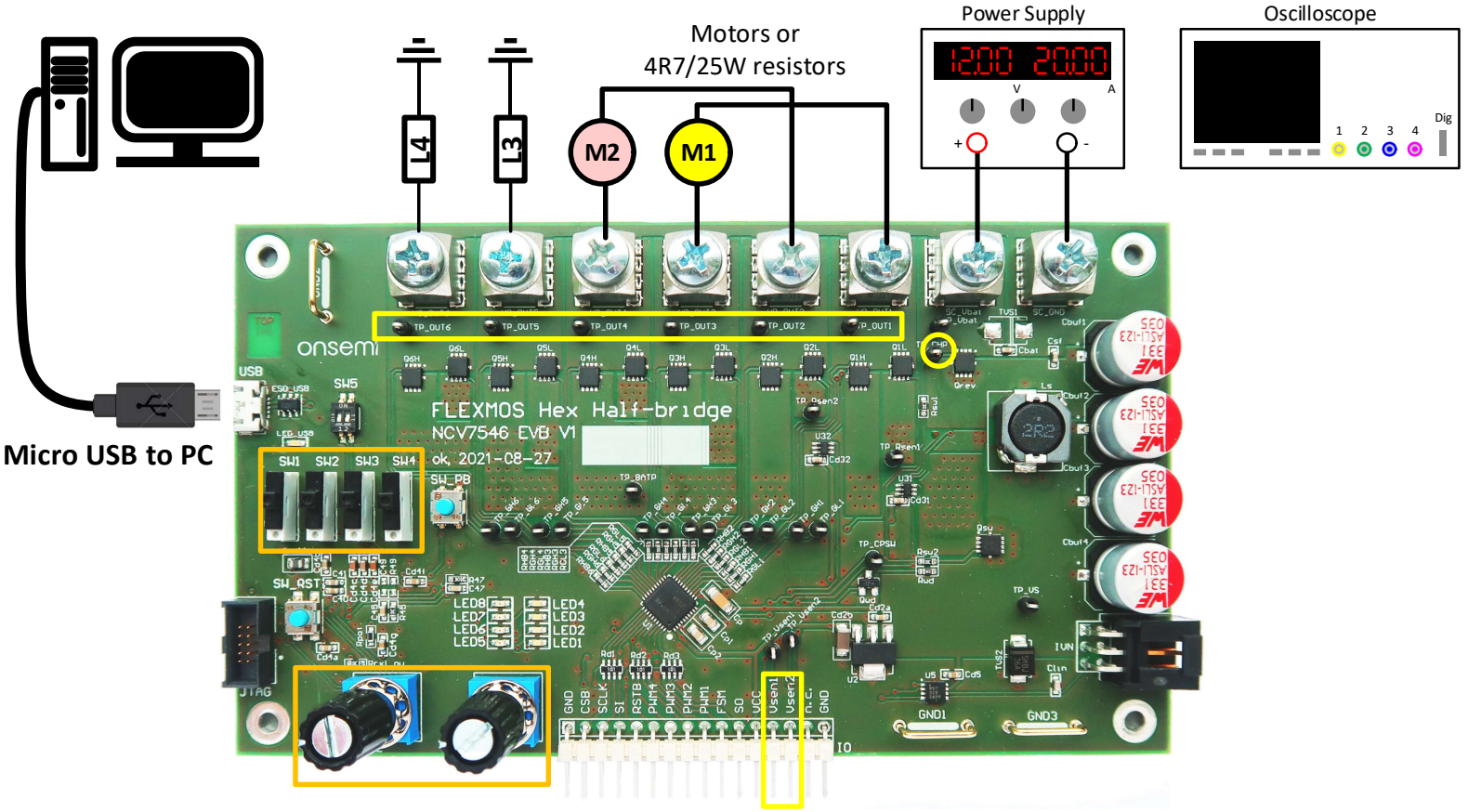

Figure 1: Test Setup Configuration

Required Equipment

- Oscilloscope
- Bench Power Supply, current capability min. 10 A, Ampermeter
- Voltmeter (alternatively free oscilloscope channel)
- Four loads (12V motors or power resistors 4R7/25W)
- PC Software for NCV7546 EVB Control
- Micro USB Cable
- NCV7546 Evaluation Board

Test procedure Step 1 (Connect the board):

1. Connect supply
2. Check I_{BAT}
3. Check VCC voltage on IO

Table 1: Desired Results

$I_{BAT} = I_{Bat\_NotProgrammed}$
V(VCC) = VCC

Test procedure Step 2 (Program the MCU):

1. Connect programmer through JTAG connector
2. Load and flash .hex files (bootloader and application)
3. Disconnect supply

Test procedure Step 3 (Standalone mode, outputs off):

4. Connect loads (motors or resistors)
5. Turn Pot1 and Pot2 left
6. Connect supply
7. Check I_{BAT}
8. Check V_{CHP} voltage on TP_CHP
9. Check Vsen voltage on IO

Table 2: Desired Results

LED1 on
$I_{BAT} = I_{Bat\_act}$
V(TP_CHP) = V_{CHP}
V(Vsen1)= Vsen_off (when duty-cycle 0%)
V(Vsen2)= Vsen_off (when duty-cycle 0%)

Test procedure Step 4 (Standalone mode, outputs on):

1. Set SW1-4 up
2. Turn Pot1 and Pot2 right
3. Check OUT1-6 voltage on TP_OUT1-6
4. Check Vsen voltage on IO

Table 3: Desired Results

LED1 on
V(HB_OUT1) = OUTx LS / OUTx HS (PWM per Pot1)
V(HB_OUT2) = OUTx LS / OUTx HS (PWM per Pot2)
V(HB_OUT3) = OUTx LS
V(HB_OUT4) = OUTx LS
V(HB_OUT5) = OUTx HS
V(HB_OUT6) = OUTx HS
V(Vsen1) = Vsen_on (when duty-cycle 100%)
V(Vsen2) = Vsen_on (when duty-cycle 100%)

Test procedure Step 5 (Standalone mode, outputs on):

1. Set SW1/2 down
2. Turn Pot1 and Pot2 right
3. Check OUT1-6 voltage on TP_OUT1-6
4. Check Vsen voltage on IO

Table 4: Desired Results

V(HB_OUT1) = OUTx LS
V(HB_OUT2) = OUTx LS
V(HB_OUT3) = OUTx LS / OUTx HS (PWM per Pot1)
V(HB_OUT4) = OUTx LS / OUTx HS (PWM per Pot2)
V(HB_OUT5) = OUTx LS
V(HB_OUT6) = OUTx off
V(Vsen1)= Vsen_on (when duty-cycle 100%)
V(Vsen2)= Vsen_on (when duty-cycle 100%)

Test procedure Step 6 (PC Mode):

1. Connect USB
2. Start NCV7546 Control Software
    a. Basic Window: Try all controls (Run Forward, Run Backward, Stop, Speed Control)
    b. Board Window: Check Status bits and Motor Current and Supply

Table 5: Desired Results

LED3 on
OUT1-6 = OUTx LS / OUTx HS (PWM duty-cycle per PWM1-4 slider position)
Motors controlled by buttons and PWM generators
Board status bit reflecting board state
Board measured values reflecting board state

DC Characteristics

	MIN	TYP	MAX
VCC	4.9 V	5.0 V	5.1 V
$I_{Bat\_NotProgrammed}$			50 mA
I_{Bat_act} (outputs off)		90 mA	110 mA
V_{CHP}, Active mode	Vbat + 8.3 V	Vbat + 8.9 V	Vbat + 9.5 V
OUTx LS	0 V		0.1 V
OUTx HS	Vbat – 0.2 V		Vbat
OUTx off	0 V		0.1 V
Vsen_off			1 mV
Vsen_on		0.1 x I(HB_OUTx)	

PC Software

Window	Parameter	TYP
Board	Supply Voltage	V_{Bat}
Board	Isen 1	I(HB_OUT1/3/5)
Board	Isen 2	I(HB_OUT2/4/6)
Board	Status Bits	Normal Mode set