H-Bridge Ch-A

Vcc

GPow_Q1A Q1 NMOS
GPow_Q2A Q2 NMOS
GPow_Q1A Q3 NMOS
GPow_Q2A Q4 NMOS
ML-A   MR-A
GPow_Q3A Q5 NMOS
GPow_Q4A Q6 NMOS

Gate-Source Protection

EmtrA1 100 R_Gate-Protect_AQ1   GPow_Q1A
100k R_Pull-Down_AQ1

EmtrA2 100 R_Gate-Protect_AQ2   GPow_Q2A
100k R_Pull-Down_AQ2

EmtrA3 100 R_Gate-Protect_AQ3   GPow_Q3A
100k R_Pull-Down_AQ3

EmtrA4 100 R_Gate-Protect_AQ4   GPow_Q4A
100k R_Pull-Down_AQ4

Control Circuit Isolation

U1 PS2801-4

LED_An_+_A   1   16 V_HS-A
             2   15 EmtrA1
LED_An_-_A   3   14 V_HS-A
             4   13 EmtrA2
LED_Ct_+_A   5   12 V_LS-A
             6   11 EmtrA3
LED_Ct_-_A   7   10 V_LS-A
             8   9   EmtrA4
R_ILT_m1 250, R_ILT_m2 250, R_ILT_m3 250, R_ILT_m4 250

Test Switches

SW1 +5V   PWM_A
     PWM_A

SW2 +5V   DIR_A
     DIR_A

NMOS_Gate_Driver

V_HS-A
L1 10mH   D1 1N4007
Vcc R1 100   D2   C1 100uF   V_LS-A
V_Gate-Boost Q7 NMOS
D3 V_LS-A

Short circuit protection

V_Bat
F1 Fuse_30A(Slow)
Vcc

LED_Ct_-_A
PWM_A   LED_An_+_A

AO3405
PWM_A   LED_An_-_A
Q8
D4 1N4007
R6 10k Q9
AO3400A   LED_Ct_+_A
DIR_A

Boost Gate Control

V_LS-A
U2 NE555P
4 RESET VCC 8
6 THRES DISCH 7
2 TRIG   OUT 3
5 CONT   GND 1
C2 100nF
C3 100nF
R5 33k
100 R_Gate-Protect_Boost1   V_Gate-Boost
100k R_Pull-Down_Boost1

PCB Terminals

J2 Motor_A
1 ML-A
2 MR-A

J1 1
    2 V_Bat
Battery Terminal

MCU Terminals
1
2 DIR_A
3 PWM_A
4 PWM_B
5 DIR_B
6
7 +5V

5V 5A Power Supply

U3 XL4015
Vcc
C5 220uF C4 1uF C6 1uF
5 VIN   SW 3
6 VC   FB 2
       GND 1
L2 47mH
D7 1N5822
C7 10nF C8 330uF
5V

5V-J2

Indicator LEDs

C_Filter_Left1 1000uF
ML-A BLUE D5 R7 1.2k D6 1N4007 MR-A

C_Filter_Right1 1000uF
MR-A BLUE D8 R10 1.2k D9 1N4007 ML-A

Vcc GREEN D10 R11 1.5k

Notes:
1. Driving frequency shouldn't increase more than 100kHz
   and should not be less than 1kHz.