LSI/CSI

BRUSH DC MOTOR DRIVE USING THE LS7260/7261/7262 BRUSHLESS DC MOTOR COMMUTATOR IC

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The LS7260 series of Brushless DC Motor Commutator ICs can easily be used to drive Brush DC motors. All the features for driving Brushless DC motors still apply, including Enable, Speed Control, Overcurrent Protection and Braking. Figure 1 illustrates a Brush DC motor driven by a Power FET H-Bridge. Figure 2 illustrates a Power Bipolar Transistor H-Bridge driver configuration. In both cases, the SENSE inputs (Pins 15, 16 and 17) and the COMMUTATION SELECTS (Pins 1, 20) are left floating. Internal resistors will cause the SENSE inputs to be a logic one and the COMMUTATION SELECTS to be at logic zero. Figure 1 shows the LS7260 driving a Power FET H-Bridge. In this case, OUTPUT 2 (Pin 3) is OFF in the motor forward direction and ON in the motor

reverse direction and OUTPUT 4 (Pin 6) is ON in the forward direction and OFF in the reverse direction. OUTPUT 1 (Pin 2) is ON in the forward direction and OFF in the reverse direction while OUTPUT 5 (Pin 7) is OFF in the forward direction and ON in the reverse direction. Note that when OUTPUT 2 or OUTPUT 1 is OFF, PMOS transistors Q1 and Q2 are turned on because their gate resistors are returned to ground. When these Outputs are ON, Q1 and Q2 are turned off because their gates are pulled up to Vss. Current is seen to flow through Q1, the motor, and Q4 in the forward direction and Q2, the motor and Q3 in the reverse direction. The COMMON (Pin 5) must be connected to Vss in this configuration.
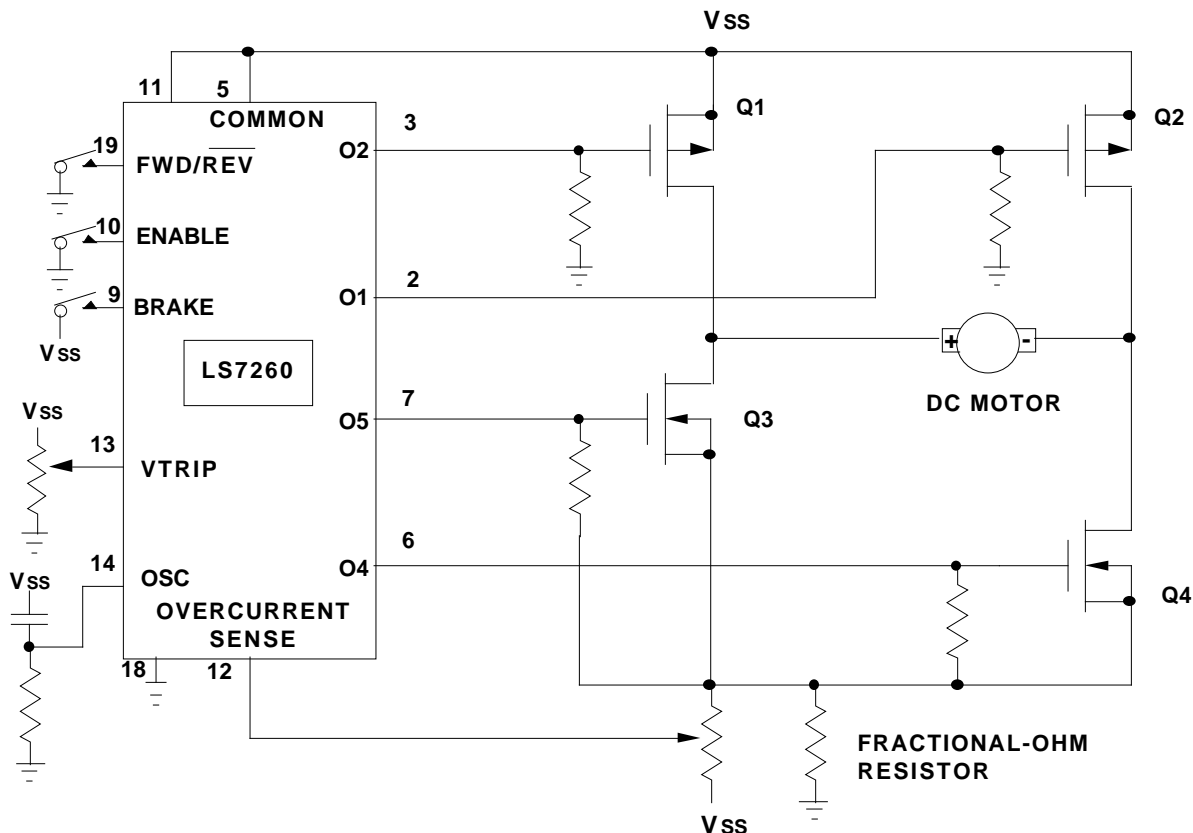

FIGURE 1. LS7260 DRIVING A POWER FET H-BRIDGE

Figure 2 shows the LS7261/LS7262 driving a Power Bi-polar Transistor H-Bridge. In this case, OUTPUTS 2 and 4 are ON in the forward direction and OFF in the reverse direction while OUTPUTS 1 and 5 are ON in the reverse direction and OFF in the forward direction. Current flows through Q1, the motor, and Q4 in the forward direction and Q2, the motor, and Q3 in the reverse direction. The COMMON (Pin 5) must be left floating in this configuration.

Whether the motor is driven by either the LS7260 or the LS7261/LS7262, the FORWARD/REVERSE input functions identically. If this input is left floating, the motor operates in the forward direction, since this input has an internal pull-up resistor. If the input is tied to ground, the motor operates in the reverse direction.

Overcurrent protection is shown in Figures 1 and 2 and is identical in operation to Brushless DC motors. Speed Control is also identical in operation to Brushless DC motors. The VTRIP input (Pin 13) is used in conjunction with the OSCILLATOR (Pin 14) to produce a pulse width modulated output drive to control the speed. Applying a logic one to the BRAKE input (Pin 9) will cause transistors Q1 and Q2 to be off while Q3 and Q4 are turned on shorting the windings together. A high level at the ENABLE input (Pin 10) will allow drive to the H-Bridge transistors. A low ENABLE input will disable all H-Bridge transistors. Refer to the LS7260/LS7261/LS7262 data sheet for more details on these features.
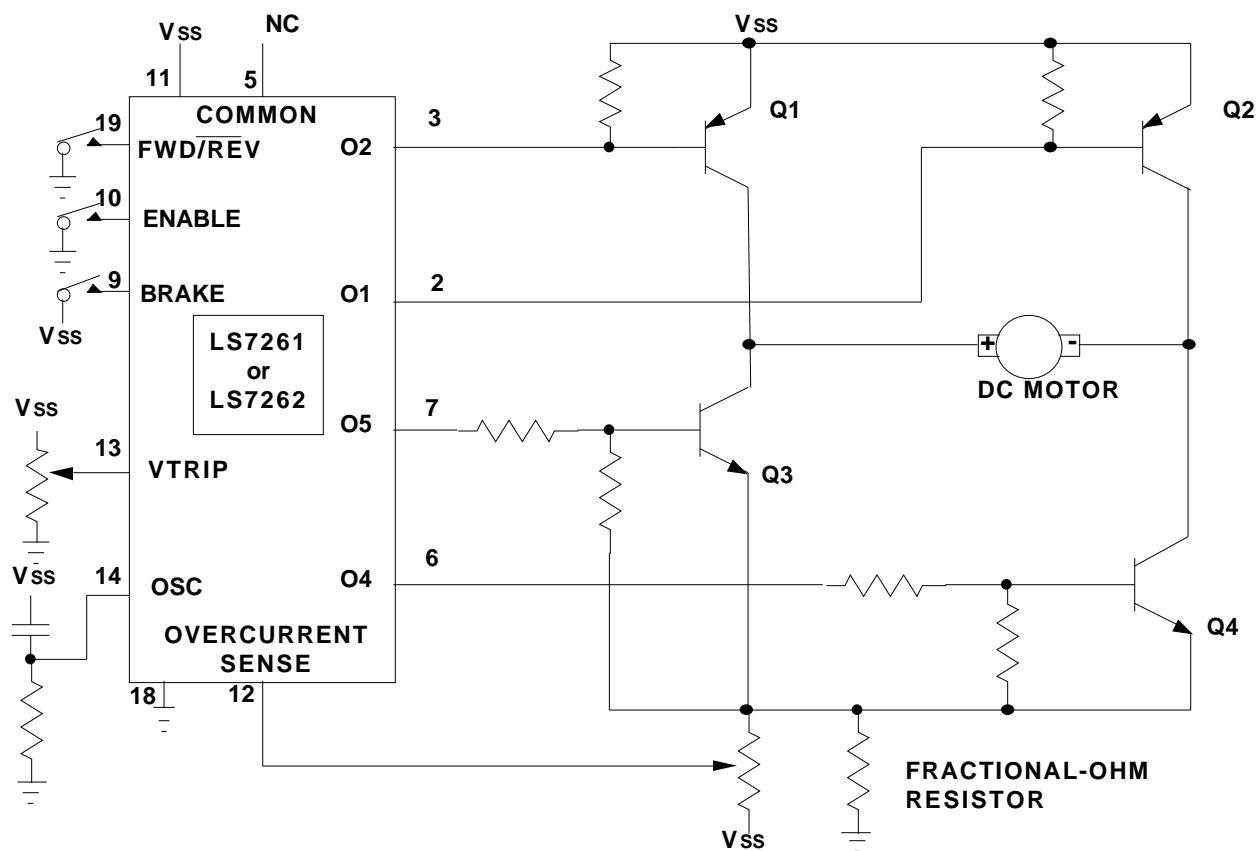

FIGURE 2.
LS7261/LS7262 DRIVING A POWER BIPOLAR TRANSISTOR H-BRIDGE