Motor Control Using the

TMS320LF2407 DSK and the TMS320F243 DSK.

Description of Circuit

The circuit on the following page provides drive circuitry to interface a stepper motor and a DC motor to the TMS320F243 DSK or the TMS320LF2407 DSK.

Example code in C is provided for the TMS320LF2407 DSK.

Equipment Required

Stepper motor with two windings and four wires. Typically 12V, up to 1A. Can be salvaged from an old disk drive.
D.C. motor e.g. 12V, as used for example in models, small drills.
Oscilloscope or DC meter to measure output power.

Application using TMS320LF2407 DSK: Stepper Motor

Uses a L293D driver chip to interface stepper motor to the TMS320LF2407 DSK. An L293 motor driver may also be used, but requires 8 external protection diodes.

A single potentiometer controls both the speed and direction of motion. The centre position is off.

The connection of the stepper motor is as follows. The first winding is connected between M1+ and M1-. The second winding is connected between M2+ and M2-.

The code to carry out this task is provided in the directory `stepper`.

Application using the TMS320LF2407 DSK: DC Motor

Uses the T2PWM of the TMS320LF2407 DSK to output to control the speed of a D.C. motor through a simple logic-level input power MOSFET.

The potentiometer controls the output form 0 to 100%.

Two further ADC inputs measure the motor current and the supply voltage. From the current and voltage, the power dissipated in the motor is calculated and used to generate an output on T1PWM. The output is 0 to 3.3V representing 0 to 33W i.e. 1V out represents 10W. This means it is possible to monitor the power being taken by the motor.

The power output is not a steady DC. There is an AC ripple, which is caused by commutation.

The code is provided in the directory `dcmotor`.

References:

Data sheet for Texas Instruments L293D motor driver chip.

Data sheet for Harris RFP3055RLE MOSFET.

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Template…… A basic project for the TMS320LF2407 DSK. Configures an analog-to-digital converter and generates a pulse width modulation (PWM) output.

To View Applications Please Click

Signal Generation……... TMS320LF2407 DSK: Sine

Audio Interface……..…… TMS320LF2407 DSK: FIR
TMS320LF2407DSK: IIR
TMS320LF2407 DSK: FFT

Motor Control……...TMS320LF2407 DSK: Stepper Motor
TMS320LF2407 DSK: DC Motor

Click here to view..... Route Map

Schematic 3 Below ↓

MOTOR CONTROL USING THE TMS320F243 DSK / TMS320LF2407 DSK