

Stepper Motor Controller

November 26, 2008

Contents

1 Introduction	1
2 TMC223	2
3 I2C Communications	2
4 Options	2
4.1 HW Switch Opto	2
4.2 Optional VDD Zener	3
5 Jumpers	3
6 Edge Connector	4
7 Drawings	4
7.1 Circuit Diagram	4
7.2 PCB Drawings	6
8 Revision History	6

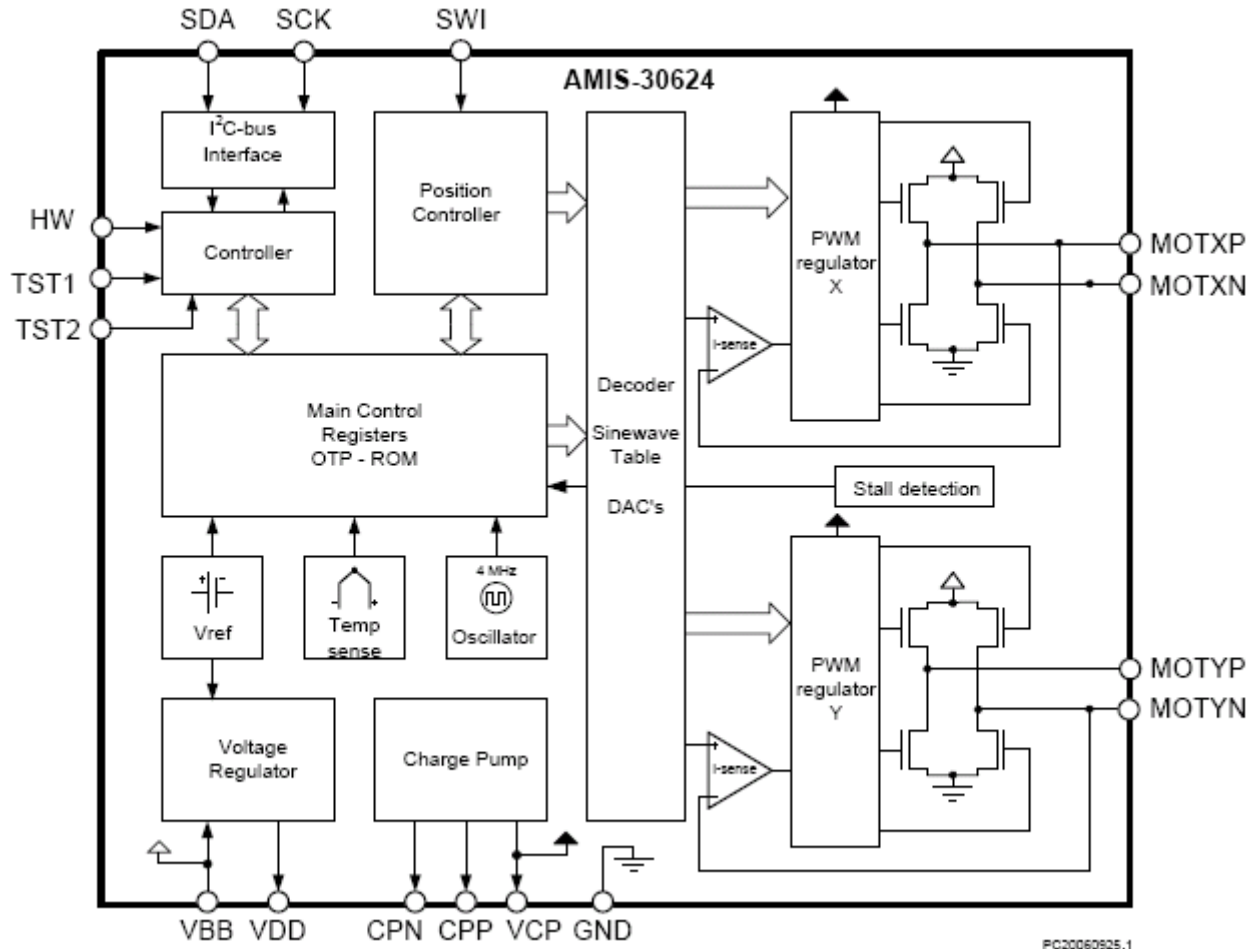
1 Introduction

SIP223 is a Stepper Motor control and drive module based on the [Trinamic TMC222](#) or [TMC223](#). The TMC 223 is the same chip as the [Onsemi / AMIS AMIS-30624](#)

- Complete motor control with position, velocity and acceleration control.
- 800mA bipolar (4 wire) drive
- Microstepping up to 16x
- Fixed frequency PWM current-control
- Sensorless stall detection

2 TMC223

The TMC222 is a simpler part without the sensorless stall detection. The TMC223 and the identical AMIS30624 have stall detection.



3 I2C Communications

The base address if PCF8591 is 0xC0. 1 sub-address is available through J1-3.

More subaddresses can be programmed into the OTP memory of the chip. Alternatively it could be used with our [4 way bus multiplexor](#).

4 Options

4.1 HW Switch Opto

The HW/A0 pin has 2 functions.

1. Sets the lowest bit of the I2C Address, when connected to either VBAT or GND
2. When open circuit, causes emergency stop (TO BE CONFIRMED)

In normal operation the HW switch is closed.

To use a plain mechanical HW switch you need to cut J4.

If the stop signal is an electronic control rather than a mechanical contact, then you can fit an OptoMOS type isolator at IC2. This is normally energised. Cut J4,5,6

4.2 Optional VDD Zener

You can fit Z1 the optional 6.2V protection zener where there is a chance of reversed or over voltage supply to the I2C bus, or where destructive voltages might get applied to the ADC inputs. In some cases it will prevent or limit damage spreading through the system

5 Jumpers

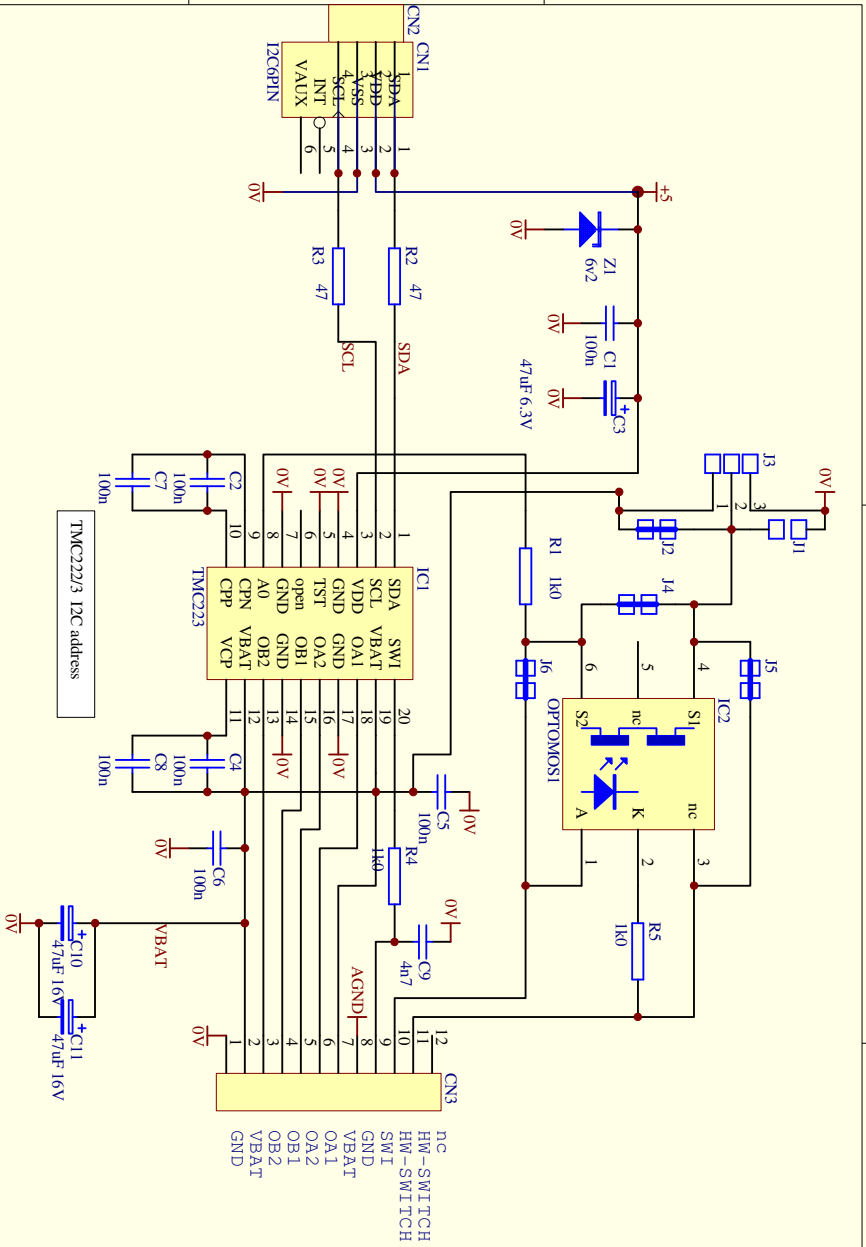
J#	Function	default	
J1-2, J3	I2C Sub Address	joined to 0	
J4	Bypass external HW switch. Cut to use HW switch	closed	
J5,6	Bypass HW switch optoisolator. Cut to use isolator	closed	

6 Edge Connector

Pin	Function	
1	SDA	
2	+5	
3	GND	
4	SCL	
5	GND	
6	VBAT	
7	Motor OB2	
8	Motor OB1	
9	Motor OA2	
10	Motor OA1	
11	VBAT	
12	GND	
13	SWI switch input	
14	HW-Switch	
15	HW-Switch	
16	nc	

7 Drawings

7.1 Circuit Diagram

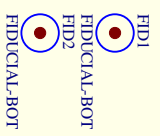
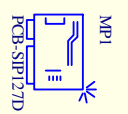


IC1 is available from multiple sources.
They all come from the same fab.

Trianamic TMC222 no equivalent
Trianamic TMC223 = Onsemi AMIS-30624

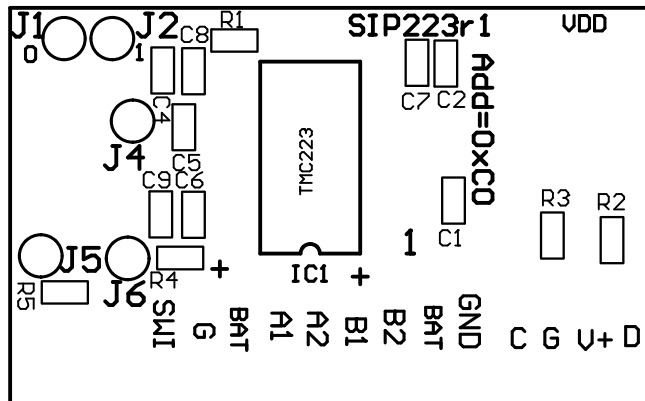
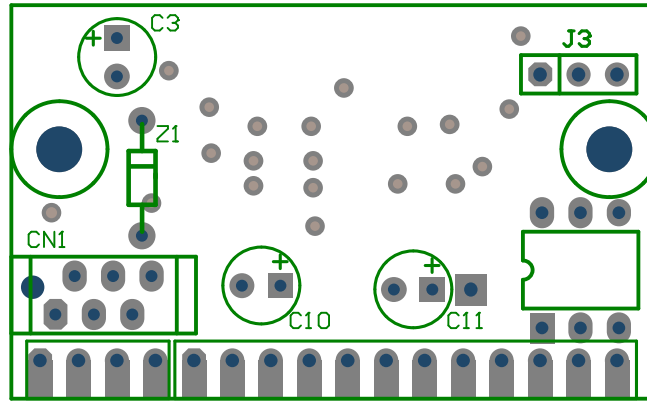
- Jumpers**
- J1-J2 I2C Address (solder)
 - J3 I2C Address (pin header)
 - J4 Bridge HW Switch
 - J5, J6 Bypass HW Isolator

Designed and Manufactured by
Broadcast Equipment Ltd
www.i2chip.com



Title		I2C Stepper Motor Controller	
Size	A4	Number	
Date:	26-Nov-2008	Sheet of	5
File:	C:\admin\I2C\ADM\I2C\AI.dtb	Drawn By:	SJD
Revision			

7.2 PCB Drawings



8 Revision History

Date	Rev#	Changes
	0	Pre-release