# SilentStepStick-TMC2209 Schematic

## IC1 — TMC2209-LA

Left side pins:
- 15 VCC_IO
- 8 5VOUT
- 3*3 GND
- 20 STDBY
- 2 ENN
- 16 STEP
- 19 DIR
- 11 DIAG
- 12 INDEX
- 7 SPREAD
- 9 MS1
- 10 MS2
- 13 CLK
- 14 PDN_UART
- 17 VREF

Top side pins:
- 15 VS
- VCP
- 6 CPI
- 5 CPO
- 4 OA1
- 24 OA2
- 21 OB1
- 26 OB2
- 1 BRA
- 23 BRB
- 27

## Components

- C1 100n/50V — VIO / GND
- C2 4u7/6V3 — +5V / GND
- C3 100n/50V 22*2 — GND
- C5 100n/50V — GND
- C7A 1u/50V
- C7B 10u/35V — GND
- C8 10u/35V optional — VM / GND
- C4 22n/50V
- C6 100n/50V
- R1 20k — PDN_UART
- R2 20k — EN
- R4 20k — GND
- R5 20k — VREF / +5V
- R6 R0805/0R11 — GND
- R7 R0805/0R11 — GND
- JMP — PDN_UART

## Connectors

### J1 (MA08-1)
- 8 EN
- 7 MS1
- 6 MS2
- 5 SPREAD
- 4
- 3 STEP
- 2 DIR
- 1

### J2 (MA08-1)
- 8 VIO
- 7 OB2
- 6 OB1
- 5 OA1
- 4 OA2
- 3
- 2 VM
- 1
- GND / GND

### J3 (MA02-1)
- 2 DIAG
- 1 INDEX

### REF (MA02-1)
- VREF

## Notes

```
VRef 0...2.5V (0.11 Ohm  sense resistor)
>=2.50V 100%  - 1.77A RMS
   1.25V  50%  - 0.88A RMS
   0.50V  20%  - 0.35A RMS

EN (with pull-up)
  GND     driver enabled
  VCC     driver disabled

PDN/UART (with pull-down)
  GND     automatic standstill current reduction
  VCC     automatic standstill power down disable
  optional UART interface
```

| MS1 | MS2 | Steps | Interpolation |
|-----|-----|-------|---------------|
| GND | GND | 8  | Yes to 256 |
| VIO | GND | 32 | Yes to 256 |
| GND | VIO | 64 | Yes to 256 |
| VIO | VIO | 16 | Yes to 256 |

```
SPREAD (with pull-down)
  GND     stealthChop
  VIO     spreadCycle

To access all other modes you have to use the UART interface.
```

# Component Side View
## (Bottom)

Dir

Step

PDN/UART

SPREAD

MS2

MS1

En

GND

Vio - 3.3-5V

Motor Coil 1-B

Motor Coil 1-A

Motor Coil 2-A

Motor Coil 2-B

GND

Vm

DIAG Vref INDEX

C7A C7B C8 C2 C6 C3 C1 C4 D5 C5 R1 R2 R4 R5