Stepper Motor Dirver

DM

MicroSteps Setting:400~25600 DC : 24~50V

Overview

- The latest 32-bit digital processing technology
- Optically isolated differential signal input
- Ultra low vibration noise
- Built-in micro-segmentation
- Easy current setting, can be switched between 0.7~4.2A
- Integrated parameter power-on auto-tuning function
- Subdivision setting (400~25600)
- With overcurrent, overvoltage, undervoltage protection

| Features | | | | | | |
|--|--|--|--|--|--|--|
| 24~50VDC | | | | | | |
| 0.7~4.2A (PEAK) | | | | | | |
| 0~100KHz | | | | | | |
| 16 MicroSteps | | | | | | |
| Avoid high temperatures, oil mist, dust, corrosive gases | | | | | | |
| -20~+65℃ , avoid direct sunlight | | | | | | |
| | | | | | | |

The drive power supply DC power supply is universal, the DC power supply range is 24~50VDC, and the DC power supply has positive and negative power supply antireverse connection functions.

The characteristic of the output torque

1) The larger the actual current of the motor, the greater the output torque, but the more copper loss ($P=I^2R$) of the motor, the more heat the motor generates;

2) The higher the supply voltage of the driver, the higher the high-speed torque of the m

3) It can be seen from the moment frequency characteristic diagram of the stepping motor that the high speed is smaller than the medium and low speed torque.

Strengthen the heat dissipation method

1) The reliable operating temperature of the driver is usually within 60 $^{\circ}$ C, and the motor operating temperature is within 80 $^{\circ}$ C;

2) Select the automatic semi-flow mode when using, the current will be automatically reduced by half when the motor stops, to reduce the heat of the motor and the drive;

3) When installing the driver, please install it on the vertical side to make the heat dissipating teeth form a strong air convection; if necessary, install a fan near the driver to force heat dissipation to ensure the driver works within the reliable working temperature range.

| Motor and power | | | | | | |
|-----------------|---------------|--------|--|--|--|--|
| Symbol | Name | Remark | | | | |
| A+ | Phase A+ | | | | | |
| A- | Phase A- | | | | | |
| B+ | Phase B+ | | | | | |
| В- | Phase B- | | | | | |
| DC+ | input power + | 24~50V | | | | |
| DC- | input power - | GND | | | | |

| Control signal | | | | | | |
|----------------|-------------------|--------------------------|--|--|--|--|
| Symbol | Name | Remark | | | | |
| PUL+ | Pulse signal + | / | | | | |
| PUL- | Pulse signal - | / | | | | |
| DIR+ | Direction signal+ | / | | | | |
| DIR- | Direction signal- | / | | | | |
| ENA+ | Enable signal + | Only connected when used | | | | |
| ENA- | Enable signal - | Only connected when used | | | | |



| LED status indication | | | | | |
|-------------------------|---------|--|--|--|--|
| Drive working status | Symptom | | | | |
| Overcurrent Protection | | | | | |
| Overvoltage protection | | | | | |
| Undervoltage protection | | | | | |
| Phase loss protection | | | | | |

| DIP switch setting | | | | | | | |
|--------------------|-----|-----|-------|-------|--|--|--|
| SW1 | SW2 | SW3 | PEAK | RMS | | | |
| ON | ON | ON | 1.00A | 0.71A | | | |
| OFF | ON | ON | 1.46A | 1.04A | | | |
| ON | OFF | ON | 1.92A | 1.36A | | | |
| OFF | OFF | ON | 2.37A | 1.69A | | | |
| ON | ON | OFF | 2.84A | 2.03A | | | |
| OFF | ON | OFF | 3.32A | 2.36A | | | |
| ON | OFF | OFF | 3.76A | 2.69A | | | |
| OFF | OFF | OFF | 4.20A | 3.00A | | | |

SW4: The quiescent current can be set by the SW4 dial switch. OFF means that the quiescent current is set to half of the dynamic current. ON means that the quiescent current is the same as the dynamic current. In general use, SW4 should be set to ON, so that the heat generated by the motor and the driver is reduced, and the reliability is improved. After about 30ms, the current is automatically reduced to about half (60% of the actual value), and the calorific value is theoretically reduced to 30%.

| Microsteps setting | | | | | | | | | | | | | | | | |
|--------------------|---------|-----|-----|------|------|------|-------|-------|------|------|------|------|------|-------|-------|-------|
| RPM | Default | 400 | 800 | 1600 | 3200 | 6400 | 12800 | 25600 | 1000 | 2000 | 4000 | 5000 | 8000 | 10000 | 20000 | 25000 |
| SW5 | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF | ON | OFF |
| SW6 | ON | ON | OFF | OFF | ON | ON | OFF | OFF | ON | ON | OFF | OFF | ON | ON | OFF | OFF |
| SW7 | ON | ON | ON | ON | OFF | OFF | OFF | OFF | ON | ON | ON | ON | OFF | OFF | OFF | OFF |
| SW8 | ON | ON | ON | ON | ON | ON | ON | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |

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| | C | ommunication port | | 1) Four-wire motor: The output current is set to be equal to or slightly smaller than the rated current of the motor; |
|--|---|--|--|--|
| | | | | 2) Six-wire motor high torque mode: the output current is set to 50% of the rated current of the motor unipolar connection; |
| | | Mur | | 3) Six-wire motor high-speed mode: the output current is set to 100% of the rated current of the motor unipolar connection; |
| | | | | 4) Eight-wire motor series connection method: the output current can be set to 70% of the rated current of the motor unipolar connection; |
| | | | | 5) Eight-wire motor and connection method: The output current can be set to 140% of the rated current of the motor unipolar connection. |
| Terminal number | symbol | name | Description | |
| 1 | NC | | | Wiring requirements |
| 2 | +5V | Positive power terminal | External STU only | 1) In order to prevent the driver from being disturbed, it is recommended to use the |
| 3 | TxD | Sending end | | shieldedcable for the control signal, and the shield layer is shorted to the ground wire. Unless otherwise specified, the shielded cable of the control signal cable is grounded at |
| 4 | GND | Power ground | 0V | one end: theupper end of the shielded wire is grounded, and the shielded wire The drive is suspended at one end. Only the grounding at the same point is allowed in the same |
| 5 | RxD | Receiving end | | machine. If it is not a real grounding wire, the interference may be serious. At this time, the shielding laver is not connected. |
| 6 | NC | | | |
| | Outp | ut current setting value | · | 2) The pulse and direction signal lines and the motor lines are not allowed to be bundled side by side, preferably separated by at least 10 cm. Otherwise, the motor noise easily |
| For the same mot | tor, the larger the | current setting value, the larg | er the motor output | interferes with the pulse direction signal, causing the motor to be inaccurately positioned, and the system is unstable. |
| torque,but the he | at of the motor a | nd the driver is also more serie | ous when the current is | 3) If one nower supply is provided for multiple drives, parallel connections should be |
| large. The magnit value, but also to | ude of the specifi the type of exerc | c heat generation is not only r ise and the dwell time. The fol | elated to the current set lowing setting method | made at the power supply. It is not allowed to connect one to the other and then to |
| uses the rated cu | rrent value of the | stepping motor as a reference | e, but the optimum | another chain. |
| value in practical applications should be adjusted based on this. In principle, if the temperature is very low (<40 °C), the current setting value can be appropriately increased to increase the motor output power (torque and high-speed response). | | | | 4) It is forbidden to electrify the P2 terminal of the driver. When the charged motor stops, there is still a large current flowing through the coil. Pulling the P2 terminal will cause a huge moment to induce the electromotive force to burn the driver. |
| | | | | 5) It is strictly forbidden to add the tin to the terminal after adding the tin, otherwise the terminal may be overheated due to the contact resistance becoming larger. |



The DM542 driver uses a differential interface circuit for differential signals, single-ended common cathode and common anode interfaces, and a built-in high-speed optocoupler that allows reception of long-line drivers, open-collector and PNP output circuits. In the harsh environment, we recommend Long-line driver circuit with strong anti-interference ability.

Power supply

The power supply voltage can work normally within the specified range. The DQ856MA driver is preferably powered by an unregulated DC power supply, or a transformer buck + bridge rectifier + capacitor filter. Note, however, that the rectified voltage ripple value should not exceed its specified maximum voltage. It is recommended that the user supply power with a DC voltage below the maximum voltage to avoid grid fluctuations exceeding the driver voltage range.

If using a regulated switching power supply, it should be noted that the output current range of the switching power supply should be the largest.

1) Pay attention to the power supply when wiring, do not reverse

2) It is best to use an unregulated power supply

3) When using unregulated power supply, the power supply current output capability should be greater than 60% of the drive set current.

4) When using a regulated switching power supply, the output current of the power supply should be greater than or equal to the operating current of the driver.

Drive Dimensional Chart(mm)

5) In order to reduce costs, two or three drives can share one power supply.



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| Problems and handle the law | | | | | | | | |
|-----------------------------|--|---|--|--|--|--|--|--|
| phenomenon | reason | solution | | | | | | |
| | Power light is not lit | Check the power supply circuit, normal power supply | | | | | | |
| The motor does | Motor shaft is powerful | The pulse signal is weak and the signal current is increased to 7-16mA. | | | | | | |
| not run | Subdivision is too small | Selective segmentation | | | | | | |
| | Current setting is too small | Selective current | | | | | | |
| | Drive is protected | Power on again | | | | | | |
| | Enable signal is low | This signal is pulled high or not | | | | | | |
| | Does not respond to control signals | No power | | | | | | |
| Motor steering error | Motor line is wrong | Any two wires of the same phase of theexchange motor (A+ A-exchange position) | | | | | | |
| | The motor line has an open circuit | Check and pick up | | | | | | |
| | Motor line is wrong | Check wiring | | | | | | |
| Alarm Indicator is | Voltage is too high or too low | Check the power supply | | | | | | |
| on | Motor or drive damage | Replace the motor or drive | | | | | | |
| | Signal interference | Eliminate interference | | | | | | |
| Inaccurate | The shield is not connected or not connected | Reliable grounding | | | | | | |
| location | The motor line has an open circuit | Check and pick up | | | | | | |
| | Subdivision error | Set the subdivision | | | | | | |
| | Small current | Increase current | | | | | | |
| Ctall when the | Acceleration time is too short | Accelerated acceleration time | | | | | | |
| Stall when the | Motor torque is too small | Select a large torque motor | | | | | | |
| accelerates | Low voltage or too small current | Appropriately increase the voltage or current | | | | | | |