

## BRUSH LESS DC MOTOR PRE-DRIVER

## ■ GENERAL DESCRIPTION

The NJM2624 is a 3-phase brushless DC motor pre-driver which requires external power-transistors suited to drive current of the motor.

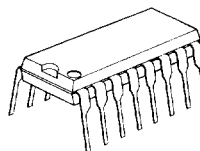
The Run Enable function is used as PWM control besides of ON/OFF switch function.

## ■ FEATURES

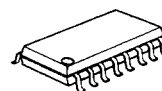
- Operating Voltage (+4.5V ~ +18V)
- Low Operating Current (10mA max)
- Output Switch Current (90mA typ.)
- Run Enable
- Forward or Reverse Direction
- Bipolar Technology
- Package Outline

DIP16, DMP16, SSOP16

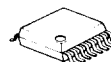
## ■ PACKAGE OUTLINE



NJM2624D

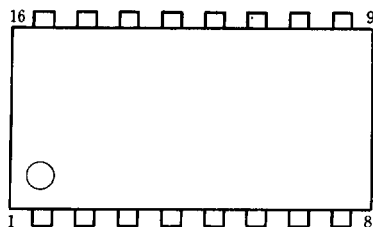


NJM2624M



NJM2624V

## ■ PIN CONFIGURATION

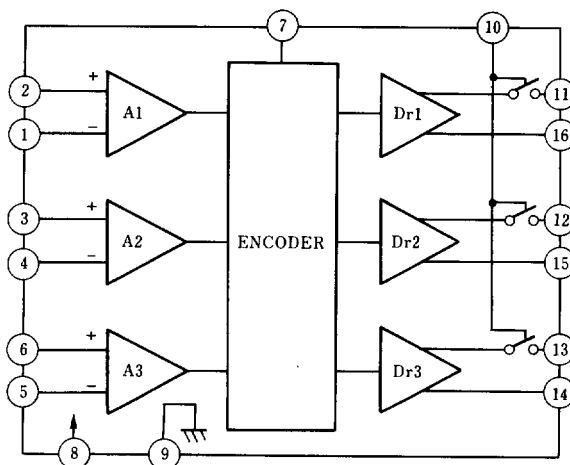


NJM2624D  
NJM2624M  
NJM2624V

## PIN FUNCTION

|          |             |
|----------|-------------|
| 1 : H1 - | 9 : GND     |
| 2 : H1 + | 10 : ON/OFF |
| 3 : H2 + | 11 : OUT1   |
| 4 : H2 - | 12 : OUT3   |
| 5 : H3 - | 13 : OUT5   |
| 6 : H3 + | 14 : OUT6   |
| 7 : F/R  | 15 : OUT4   |
| 8 : V+   | 16 : OUT2   |

## ■ BLOCK DIAGRAM





## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

| PARAMETER                   | SYMBOL           | RATINGS                                          | UNIT |
|-----------------------------|------------------|--------------------------------------------------|------|
| Supply Voltage              | V <sup>+</sup>   | 20                                               | V    |
| Output Current              | I <sub>o</sub>   | 100                                              | mA   |
| Power Dissipation           | P <sub>d</sub>   | (DMP-16) 700<br>(DMP-16) 300<br>(SSOP-16) 300    | mW   |
| Operating Temperature Range | T <sub>opr</sub> | -40 ~ +85                                        | °C   |
| Storage Temperature Range   | T <sub>stg</sub> | (D, M type-16) -40 ~ +150<br>(V type) -40 ~ +125 | °C   |

## ■ ELECTRICAL CHARACTERISTICS

(V<sup>+</sup>=12V, Ta=25°C)

### Total Device

| PARAMETER      | SYMBOL         | TEST CONDITIONS             | MIN. | TYP. | MAX. | UNIT |
|----------------|----------------|-----------------------------|------|------|------|------|
| Supply Voltage | V <sup>+</sup> |                             | 4.5  | —    | 18   | V    |
| Supply Current | I <sub>q</sub> | RL=∞, 7Pin=OPEN, 10Pin=OPEN | —    | 3.7  | 10   | mA   |

### Hole Sensor Section

| PARAMETER                       | SYMBOL           | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---------------------------------|------------------|-----------------|------|------|------|------|
| Input Offset Voltage            | V <sub>io</sub>  |                 | -4.2 | —    | 4.2  | mV   |
| Input Common mode Voltage range | V <sub>icm</sub> |                 | 1.5  | —    | 10.5 | V    |
| Input Bias Current              | I <sub>b</sub>   |                 | —    | —    | 600  | nA   |

### Output Section

| PARAMETER                | SYMBOL             | TEST CONDITIONS              | MIN. | TYP. | MAX. | UNIT |
|--------------------------|--------------------|------------------------------|------|------|------|------|
| Output Voltage 1         | V <sub>out 1</sub> | RL=470Ω, V <sup>+</sup> =12V | 8.9  | 9.5  | —    | V    |
| Output Voltage 2         | V <sub>out 2</sub> | RL=470Ω, V <sup>+</sup> =5V  | —    | 3.5  | —    | V    |
| Maximum Output Current 1 | I <sub>out 1</sub> | RL=100Ω, V <sup>+</sup> =12V | 50   | 90   | —    | mA   |
| Maximum Output Current 2 | I <sub>out 1</sub> | RL=100Ω, V <sup>+</sup> =5V  | —    | 30   | —    | mA   |
| Output Leak Current      | I <sub>leak</sub>  |                              | —    | —    | 5    | μA   |

### Run Enable Section

| PARAMETER           | SYMBOL            | TEST CONDITIONS         | MIN.                       | TYP. | MAX.                       | UNIT |
|---------------------|-------------------|-------------------------|----------------------------|------|----------------------------|------|
| Run Enable Voltage  | V <sub>on</sub>   | RL=470Ω                 | 1/2V <sup>+</sup><br>-0.5v | —    | —                          | V    |
| Run Disable Voltage | V <sub>off</sub>  | RL=470Ω                 | —                          | —    | 1/2V <sup>+</sup><br>+0.5v | V    |
| Source Current 1    | I <sub>on 1</sub> | Run Enable Terminal=GND | —                          | 250  | 400                        | μA   |

### Forward or Reverse Direction Section

| PARAMETER         | SYMBOL            | TEST CONDITIONS                           | MIN.                       | TYP. | MAX.                       | UNIT |
|-------------------|-------------------|-------------------------------------------|----------------------------|------|----------------------------|------|
| Forward Direction | V <sub>F</sub>    | RL=470Ω                                   | 1/2V <sup>+</sup><br>-0.5v | —    | —                          | V    |
| Reverse Direction | V <sub>R</sub>    | RL=470Ω                                   | —                          | —    | 1/2V <sup>+</sup><br>+0.5v | V    |
| Source Current 1  | I <sub>on 2</sub> | Forward or Reverse Direction Terminal=GND | —                          | 250  | 400                        | μA   |



■ TERMINAL DESCRIPTION

| PIN NO. | SYMBOL | FUNCTION                                 | INSIDE EQUIVALENT CIRCUIT |
|---------|--------|------------------------------------------|---------------------------|
| 2       | H1 +   | Sensor Input 1<br>Inverting Terminal     |                           |
| 3       | H2 +   | Sensor Input 2<br>Inverting Terminal     |                           |
| 6       | H3 +   | Sensor Input 3<br>Inverting Terminal     |                           |
| 1       | H1 -   | Sensor Input 1<br>Non-Inverting Terminal |                           |
| 4       | H2 -   | Sensor Input 2<br>Non-Inverting Terminal |                           |
| 5       | H3 -   | Sensor Input 3<br>Non-Inverting Terminal |                           |
| 7       | F/R    | Forward or Reverse<br>Direction Terminal |                           |



| PIN NO.                          | SYMBOL                                       | FUNCTION                                         | INSIDE EQUIVALENT CIRCUIT |
|----------------------------------|----------------------------------------------|--------------------------------------------------|---------------------------|
| 8                                | V <sup>+</sup>                               | Power Supply                                     | —                         |
| 9                                | GND                                          | Ground                                           | —                         |
| 10                               | Run Enable                                   | Output Run Enable Terminal                       |                           |
| 11<br>12<br>13<br>14<br>15<br>16 | Out1<br>Out3<br>Out5<br>Out6<br>Out4<br>Out2 | Internal Switching Transistor : Emitter Follower |                           |

■ TYPICAL APPLICATION

