

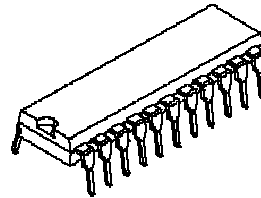
## DUAL H BRIDGE DRIVER

### ■ GENERAL DESCRIPTION

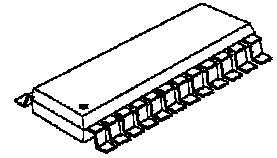
The NJM2670 is a general-purpose 60V dual H-bridge drive IC. It consists of a pair of H-bridges, a thermal shut down circuit and its alarm output. The alarm output can detect application problems and the system reliability will be significantly improved if monitored by Micro Processor.

Therefore, it is suitable for two-phase stepper motor application driven by microprocessor.

### ■ PACKAGE OUTLINE



NJM2670D2

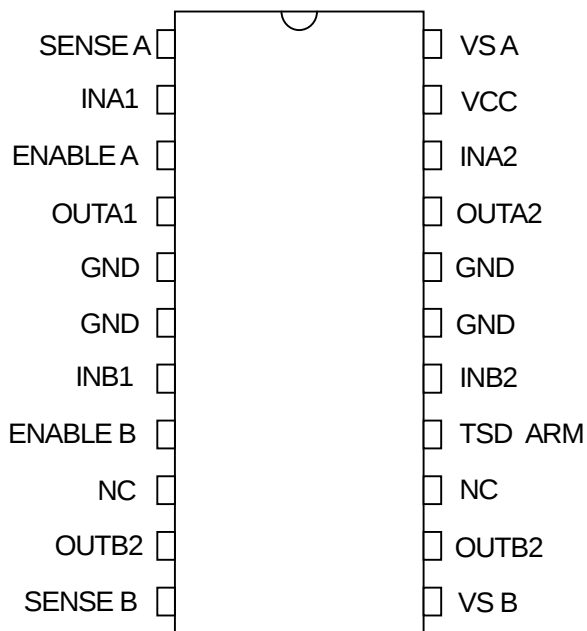


NJM2670E3

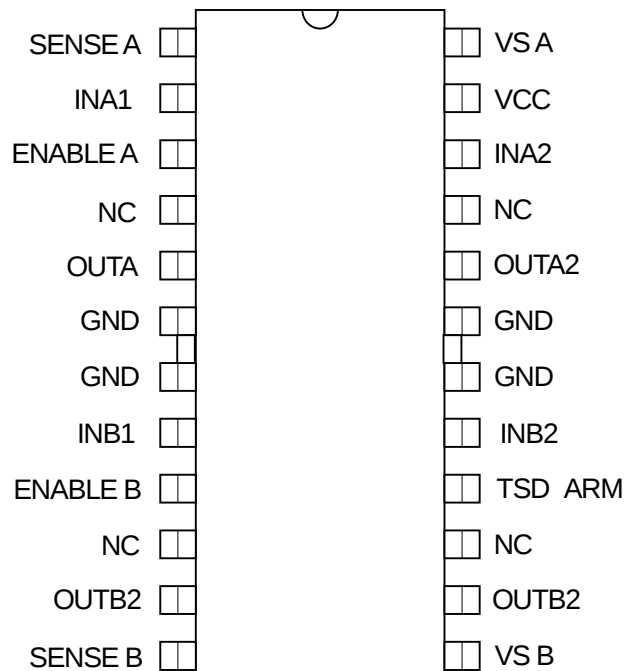
### ■ FEATURES

- Wide Voltage Range (4V to 60V)
- Wide Range of Current Control (5 to 1500mA)
- Thermal overload Protection
- Package Outline (DIP-22, EMP-24)

### ■ PIN CONNECTION



DIP-22

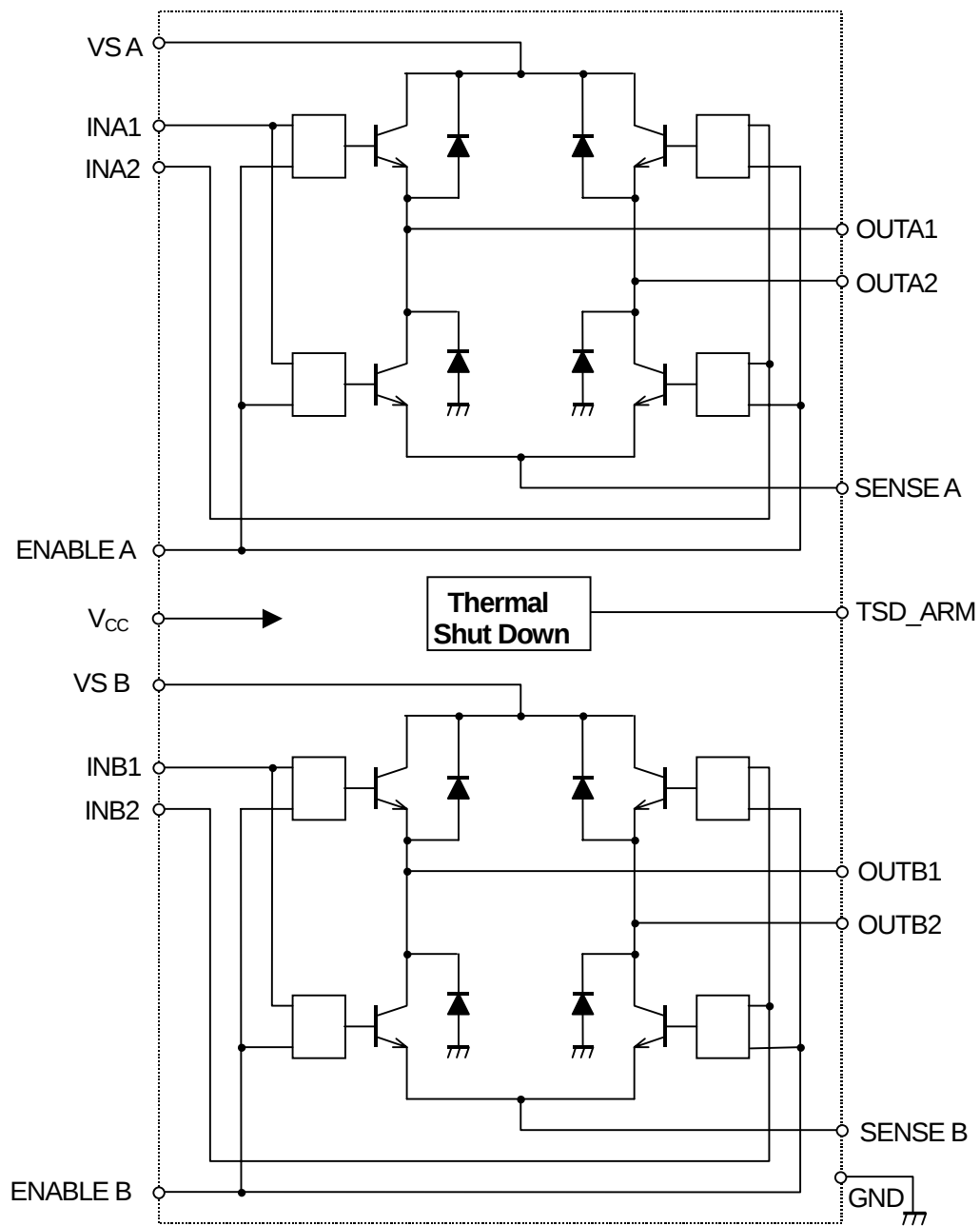


EMP-24

# NJM2670

[查询"NJM2670D2"供应商](#)

## ■ BLOCK DIAGRAM



[查询"NJM2670D2"供应商](#)

## ■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C )

| PARAMETER                      | SYMBOL     | RATINGS   | UNIT |
|--------------------------------|------------|-----------|------|
| Maximum Supply Voltage         | $V_{MM}$   | 60        | V    |
| Logic Supply Voltage           | $V_{CC}$   | 7         | V    |
| Input Voltage Range            | $V_{IN}$   | -0.3 to 7 | V    |
| Output Current                 | $I_{OUT}$  | 1.5       | A    |
| Power Dissipation@T(GND)=25°C  | $P_{D25}$  | 5         | W    |
| Power Dissipation@T(GND)=125°C | $P_{D125}$ | 2         | W    |
| Operating Junction Temperature | $T_{opr}$  | -40 ~ 85  | °C   |
| Storage Temperature            | $T_{stg}$  | -55 ~ 150 | °C   |

## ■ RECOMENENDO OPERATING CONDITIONS

| PARAMETER               | SYMBOL    | TEST CONDITIONS        | MIN. | TYP. | MAX. | UNIT |
|-------------------------|-----------|------------------------|------|------|------|------|
| Supply Voltage          | $V_{MM}$  |                        | 4    | -    | 55   | V    |
| Logic Voltage Range     | $V_{CC}$  |                        | 4.75 | 5.00 | 5.25 | V    |
| Maximum Output Current  | $I_{OUT}$ |                        | -    | -    | 1.3  | A    |
| Total Power Dissipation | $P_D$     | $T_{GND}=25^{\circ}C$  | -    | -    | 5    | W    |
|                         | $P_D$     | $T_{GND}=125^{\circ}C$ | -    | -    | 2.2  | W    |

## ■ THERMAL CHARACTERISTICS

| PARAMETER          | SYMBOL           | TEST CONDITIONS     | MIN. | TYP. | MAX. | UNIT |
|--------------------|------------------|---------------------|------|------|------|------|
| Thermal resistance | $R_{th_{j-GND}}$ | DIP22 package.      | -    | 11   | -    | °C/W |
|                    | $R_{th_{j-A}}$   | DIP22 package. Note | -    | 40   | -    | °C/W |
|                    | $R_{th_{j-GND}}$ | EMP24 package.      | -    | 13   | -    | °C/W |
|                    | $R_{th_{j-A}}$   | EMP24 package. Note | -    | 42   | -    | °C/W |

Note : All ground pins soldered onto a 20 cm<sup>2</sup> PCB copper area with free air convection,  $T_A=+25^{\circ}C$

# NJM2670

[查询"NJM2670D2"供应商](#)

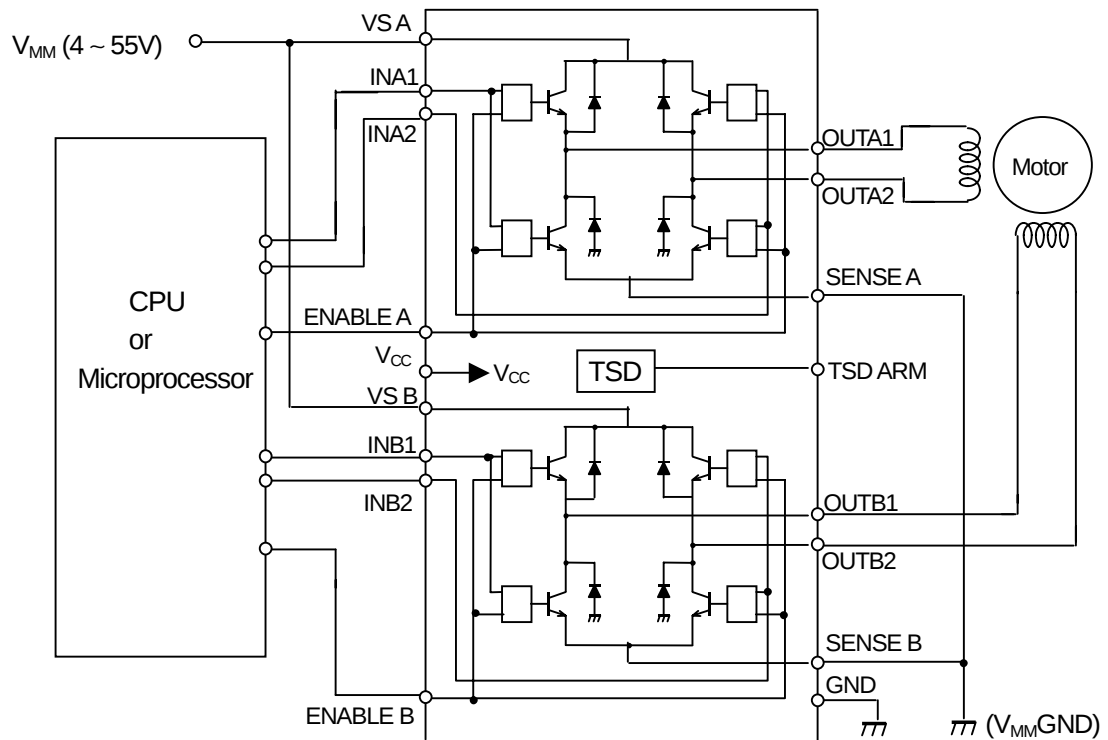
## ■ ELECTRICAL CHARACTERISTICS

| PARAMETER                       | SYMBOL                | TEST CONDITIONS                | MIN. | TYP. | MAX. | UNIT |
|---------------------------------|-----------------------|--------------------------------|------|------|------|------|
| GENERAL                         |                       |                                |      |      |      |      |
| Quiescent current               | I <sub>cc</sub>       | Enable=H, IN1=IN3=L, IN2=IN4=H | -    | 40   | -    | mA   |
| Thermal shutdown                | T <sub>tsd</sub>      |                                | -    | 170  | -    | °C   |
| Off-State leak current          | I <sub>tsd-LEAK</sub> | TSD ARM=5V                     | -    | -    | 50   | μA   |
| Thermal alarm output saturation | V <sub>tsd</sub>      | I <sub>o</sub> =5mA            | -    | 0.5  | 0.7  | V    |
| Dead time protection            | T <sub>d</sub>        |                                | -    | 1    | -    | μs   |
| LOGIC                           |                       |                                |      |      |      |      |
| Input LOW voltage               | V <sub>IL</sub>       |                                | -    | -    | 0.6  | V    |
| Input HIGH voltage              | V <sub>IH</sub>       |                                | 2    | -    | -    | V    |
| Input HIGH current              | I <sub>IH</sub>       | V <sub>i</sub> =2.4V           | -    | -    | 20   | μA   |
| Input LOW current               | I <sub>IL</sub>       | V <sub>i</sub> =0.4V           | -0.4 | -    | -    | mA   |
| OUTPUT                          |                       |                                |      |      |      |      |
| Upper transistor saturation     | V <sub>OU1</sub>      | I <sub>o</sub> =1000mA         | -    | 1.3  | 1.5  | V    |
|                                 | V <sub>OU2</sub>      | I <sub>o</sub> =1300mA         | -    | 1.5  | 1.8  | V    |
| Lower transistor saturation     | V <sub>OL1</sub>      | I <sub>o</sub> =1000mA         | -    | 0.5  | 0.8  | V    |
|                                 | V <sub>OL2</sub>      | I <sub>o</sub> =1300mA         | -    | 0.8  | 1.3  | V    |
| Upper diode forward             | V <sub>IU1</sub>      | I <sub>o</sub> =1000mA         | -    | 1.3  | 1.6  | V    |
|                                 | V <sub>IU2</sub>      | I <sub>o</sub> =1300mA         | -    | 1.6  | 1.9  | V    |
| Lower diode forward             | V <sub>IL1</sub>      | I <sub>o</sub> =1000mA         | -    | 1.3  | 1.6  | V    |
|                                 | V <sub>IL2</sub>      | I <sub>o</sub> =1300mA         | -    | 1.6  | 1.9  | V    |
| Output leakage current          | I <sub>o-LEAK</sub>   | V <sub>MM</sub> =50V           | -    | -    | 1    | mA   |
| Upper diode recovery time       | T <sub>rrU</sub>      |                                | -    | 250  | -    | ns   |
| Lower diode recovery time       | T <sub>rrL</sub>      |                                | -    | 250  | -    | ns   |

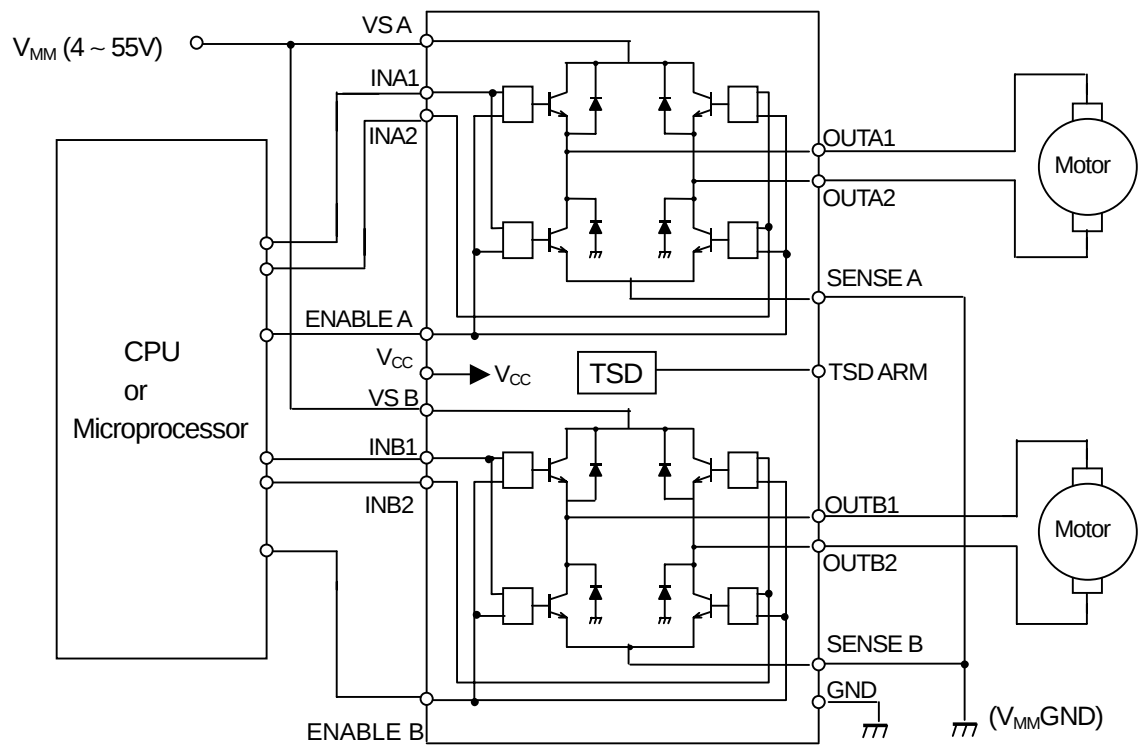
[查询"NJM2670D2"供应商](#)

## ■ TYPICAL APPLICATION

### 1). Bipolar Stepping Motor



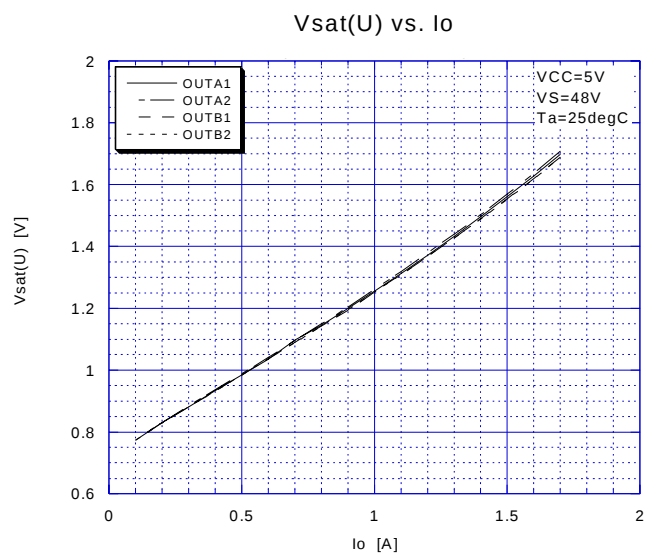
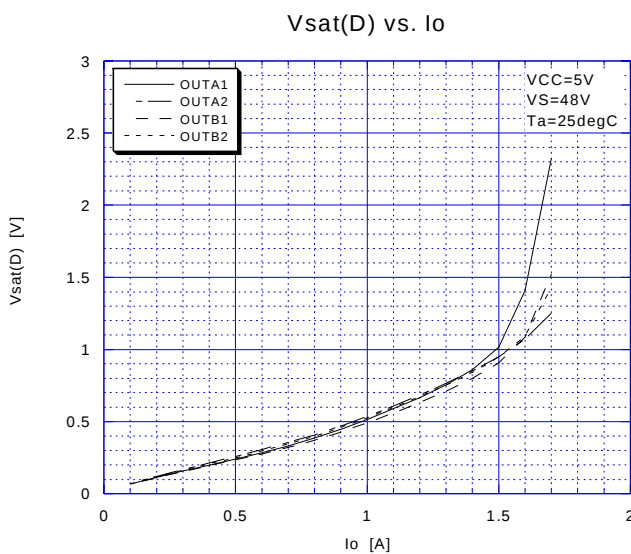
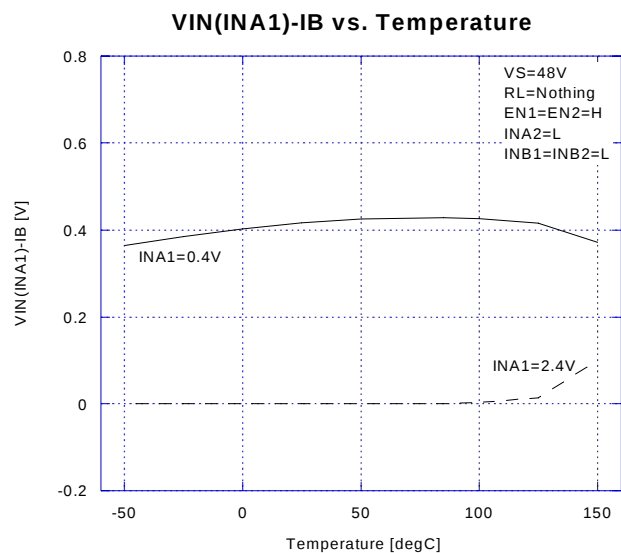
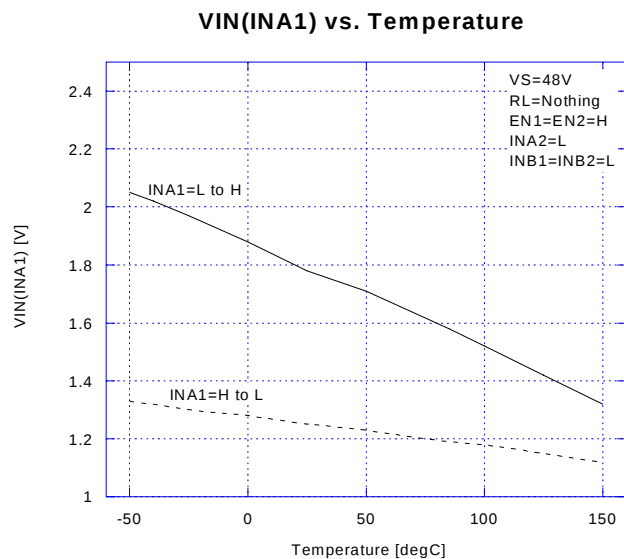
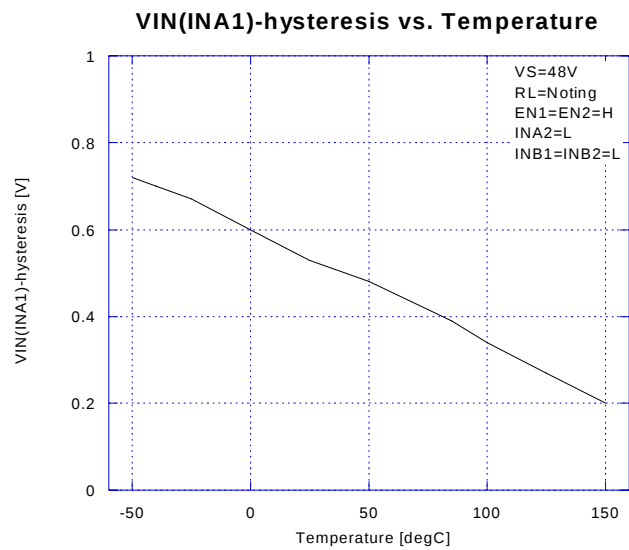
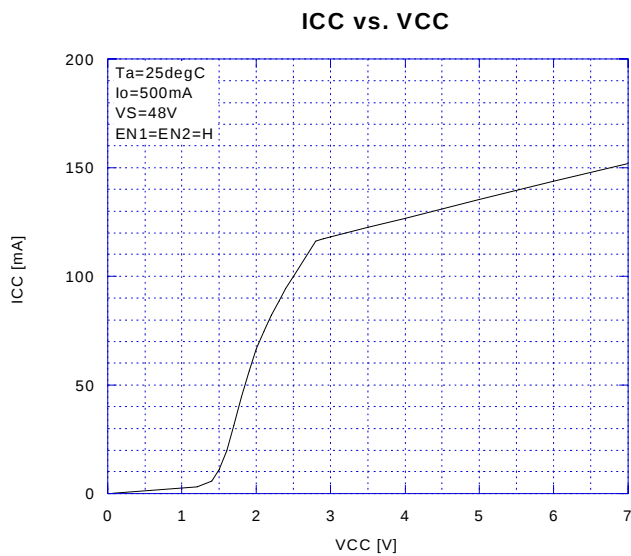
### 2). Single Phase DC Motor



# NJM2670

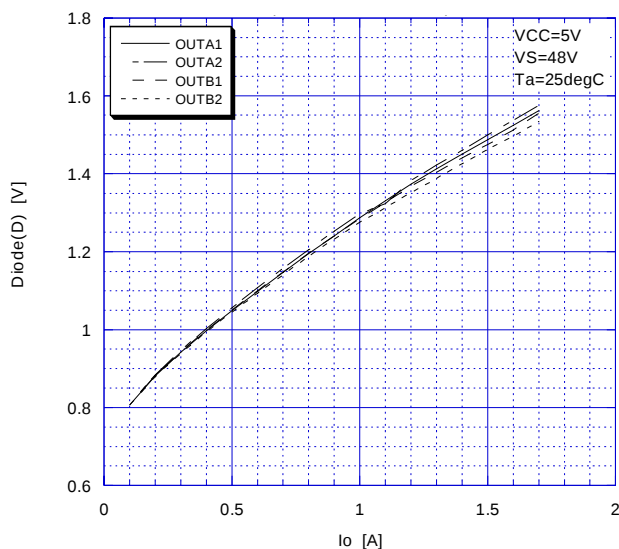
[查询"NJM2670D2"供应商](#)

## ■ TYPICAL APPLICATION 1

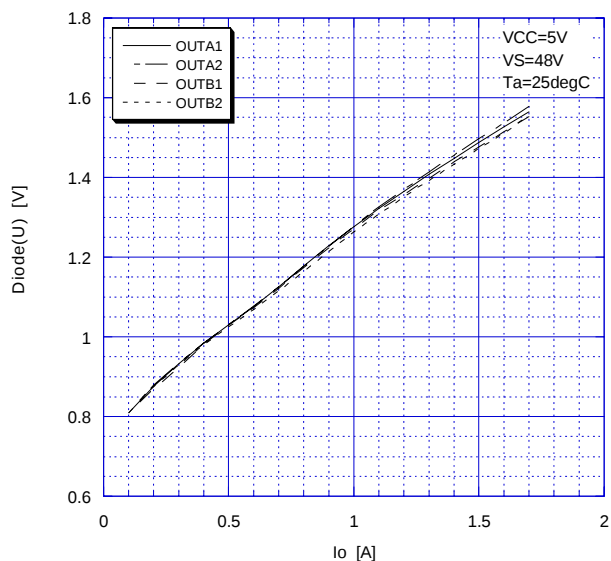


## ■ TYPICAL APPLICATION 2

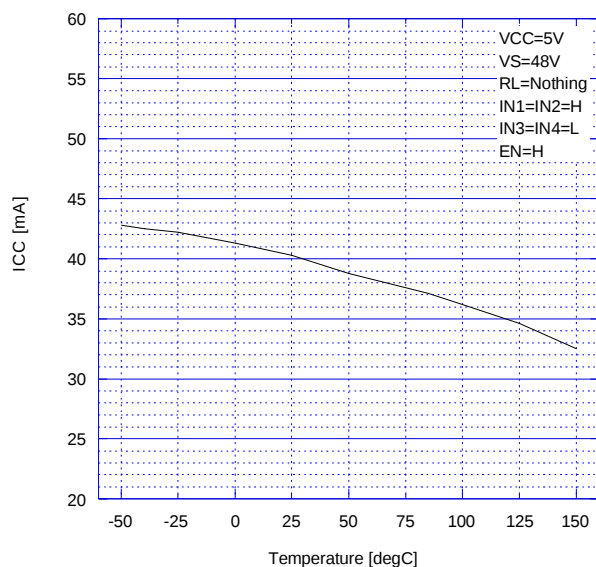
Diode(D) vs.  $I_o$



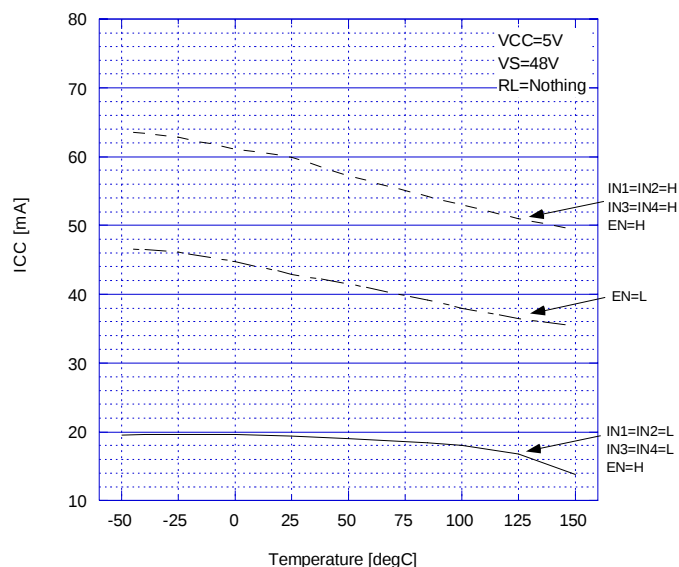
Diode(U) vs.  $I_o$



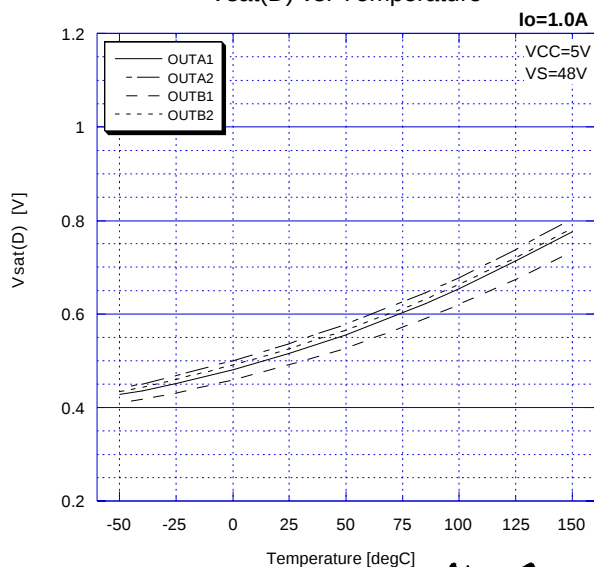
ICC vs. Temperature



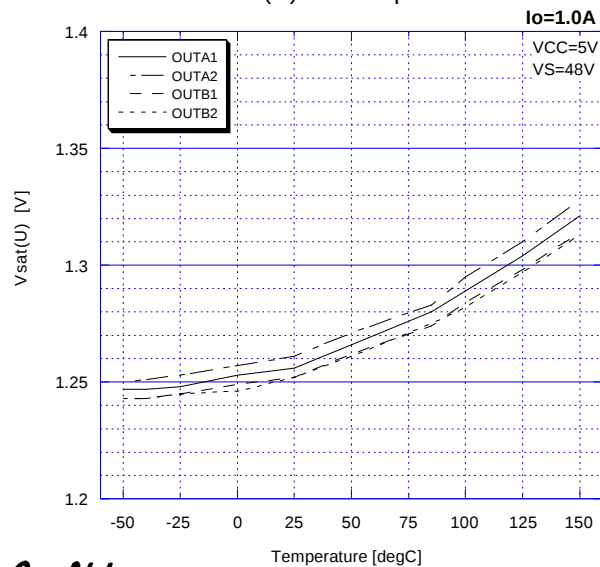
ICC vs. Temperature



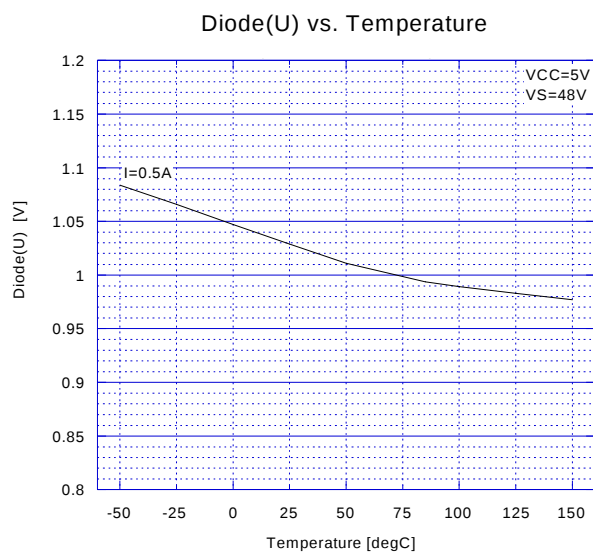
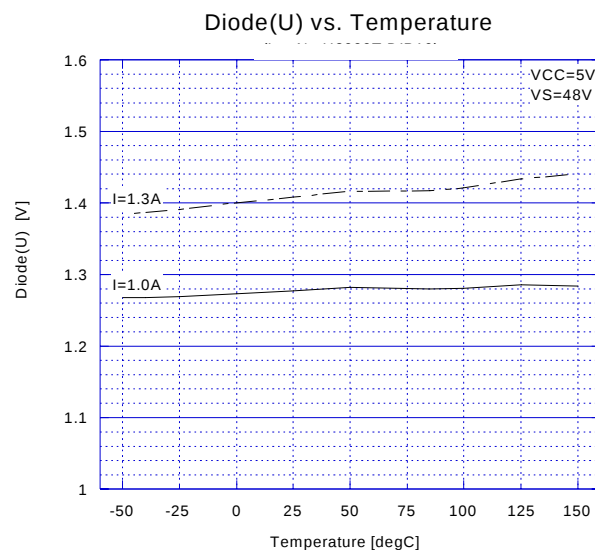
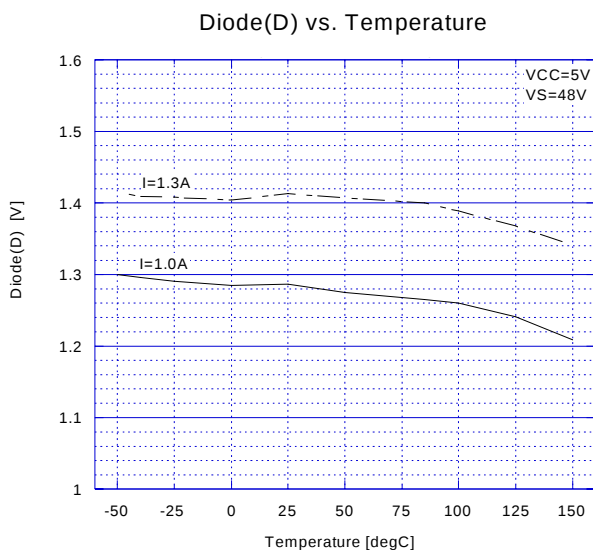
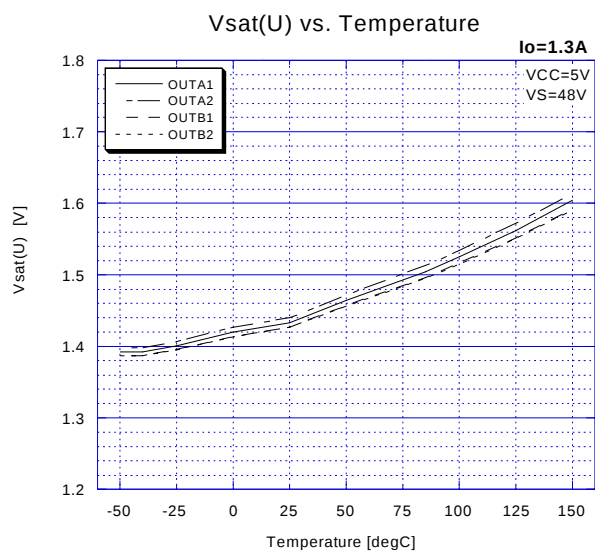
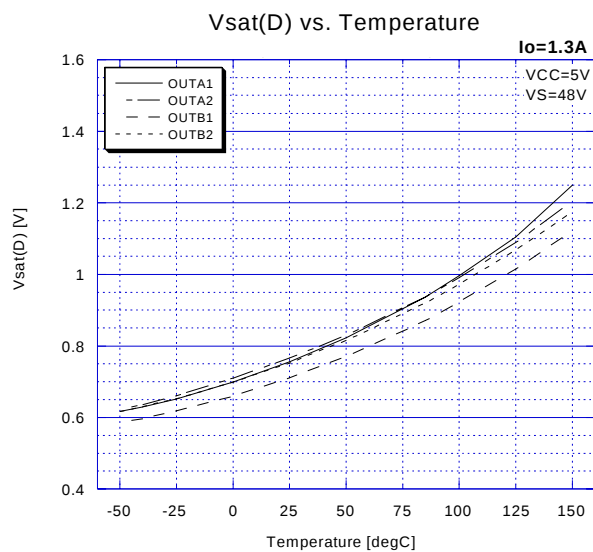
Vsat(D) vs. Temperature



Vsat(U) vs. Temperature



## ■ TYPICAL APPLICATION 3



### [CAUTION]

The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.